QMS magicolor LX®
Printer User's Guide

1800409-001A

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Dear Customer,

Mark Twain once said that only two things in life are certain: death and taxes. Well, if he were living today, we're sure he'd add manuals to this list. Just about everything you buy is accompanied by a manual—and your new QMS printer is no exception. Now, we know that even though we've devoted our lives to writing manuals, very few people actually enjoy reading them. So we've written this manual with you in mind. However, there are more of you out there than there are printers, and you all need something different. Because of this, we've tried to design your manual to help you reach your destination as easily as possible:

Table of Contents—Use this section as a road map to discover what there is to see in the manual and how the sections are related.

Overview of the Documentation—This section functions as a Welcome Center. It'll give you an idea about what's in this city (your user's guide) as well as in other nearby cities (other useful documentation).

Overview of the Manual—As long as you're at the Welcome Center, you probably want a list of local attractions. This section lets you know which chapters you really shouldn't miss and which you need to visit only if you have the time and interest, or a special purpose. It's pretty much the same information as in the table of contents, but in a descriptive format.

Headers, Footers, and Tab Dividers—Use these features as road signs to help you locate the section of the manual you want to visit.

Index—While some people like to wander through a city, stopping wherever they find something interesting, others like to call ahead to make a reservation for a specific hotel or restaurant. Our Blue Pages speed you to the information you want quickly and without unnecessary detours. Easy on, easy off. We think you'll find the blue color especially useful when you have more than one manual in the binder.

We hope you enjoy your new QMS printer (and traveling through its manuals, too!).

Your QMS Technical Writer

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* Pantone, Inc.'s check-standard trademark for color and color reproduction materials.

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Chapter 1

Introduction

Chapter highlights:

- About the documentation
- About your printer

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Introduction

This chapter provides a brief overview of the printer, an explanation of the printer documentation, and an explanation of the printer's main features and benefits.

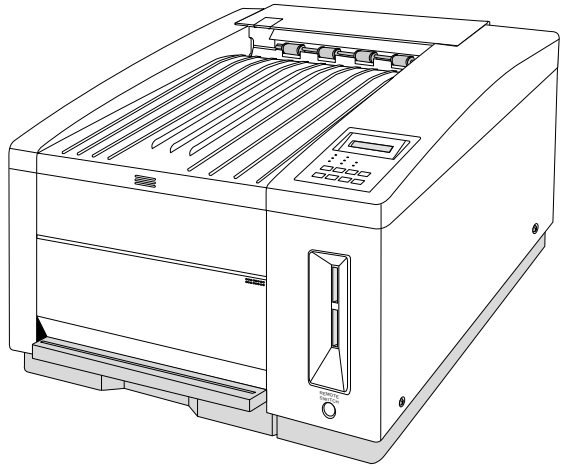

Fig. 1.1 *The QMS magicolor LX*

The *magicolor* LX produces 300 or 600 dpi color or monochrome prints, using advanced color laser technology combined with the QMS Crown multitasking printer operating system. The *magicolor* LX prints in color at a rate of 3 to 6 pages per minute, and in monochrome at 12 pages per minute. It prints on plain or laser paper and on transparencies, envelopes, labels, and thick stock, and supports letter, legal, executive, and A4 media sizes. It also features an Energy Saver mode for reduced power consumption when not printing. The printer ships with either 12 or 24 MB of RAM. See "Printer Features," later in this chapter, for a detailed list of your printer's capabilities.

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About This Manual

This User's Guide is organized in three parts, Installation (chapters 1 through 3), Operation (chapters 4 through 6), and Reference (the rest of the manual). A tab for each of these sections was included with your manual: insert them at the beginning of the appropriate chapters to make it easier to navigate the manual.

Installation

- Chapter 1: Introduction

  Gives an overview of the printer documentation and the printer's major features; it also discusses the QMS Crown operating system and laser printing.

- Chapter 2: Initial Printer Setup

  Directs you in unpacking and installing the printer.

- Chapter 3: Connecting the Printer

  Discusses Simultaneous Interface Operation (SIO) and Emulation Sensing Processor (ESP) mode, and explains how to connect the printer to a host through the LocalTalk, parallel, or serial port.

Operation

- Chapter 4: Printer Configuration

  Describes control panel components and functions and tells how to use the Configuration menu to configure the printer to your printing requirements.

- Chapter 5: Print Media and Daily Operations

  Discusses print media sizes, loading, handling, and storage. It also covers operations such as printing

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envelopes, transparencies, thick stock, and labels, adjusting print density, and canceling or ending print jobs.

- Chapter 6: Consumables and Preventative Maintenance

  Guides you through handling and replacing consumables, such as the toner, developer, cleaning pad, oil bottle, OPC belt cartridge, and waste toner pack. It also covers moving and preventative maintenance for the printer.

Reference

- Chapter 7: Optimizing Color Output

  Discusses QCOLOR, the QMS automatic color control technology, explains how to fine-tune color options, discusses color matching, and lists the printer's typefaces.

- Chapter 8: Printer Options

  Describes installing and using optional printer hardware, such as font, emulation, and security cards; memory upgrades (SIMMs); hard disks; and network interface cards. Also explains how to upgrade the system software.

- Chapter 9: Troubleshooting

  Explains how to clear jams and interpret status messages; outlines possible print quality problems and solutions; and explains how to place a service call.

- Appendix A: QMS Customer Support

  Lists sources of help and information.

- Appendix B: Technical Specifications

  Provides technical specifications for the printer and lists available supplies and replacement parts. This appendix also gives the recommended pinouts for LocalTalk, serial,

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IBM PC/XT, IBM PC/AT, and parallel (Centronics and Dataproducts) cables.

- Appendix C: Notices

  Presents legal, safety, and other notices.

- Appendix D: Additional Technical Information

  Provides information on how your printer works, and on customizing the printer's memory allocation.

- Glossary

  Explains many of the terms used in the documentation.

Optional Documentation

The following optional manuals are available from your QMS vendor:

- QMS Crown Document Option Commands

  This document lists and explains Document Option Commands (DOCs). You insert these commands into documents or separator files to enable job-specific printer features (or special features that your application or page description language can't access). In most cases, only advanced network users and system administrators need this information.

- QMS Crown Network Notes

  These notes provide tips for getting the best performance from your printer if it's connected to a network through the parallel or serial port. In most cases, only advanced network users and system administrators need this information. This manual is contained on a disk. The README file on the disk explains how to access the manual.

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- HP PCL 5 Emulation Technical Reference

  This document covers the HP PCL 5 emulation. In most cases, only advanced PCL 5 users and system administrators need this information.

- QMS Crown Technical Reference

  This document provides advanced technical information, including information on communication protocols, HP-GL emulation, HP PCL emulation, CCITT, and PostScript emulation. In most cases, only advanced users and system administrators need this information. This manual is contained on a disk. The README file on the disk explains how to access the manual.

Other Documentation

Other sources of information you may find helpful are

- HP PCL 5C Technical Support Notes

  These notes cover the HP PCL 5C color commands. They are available free through CompuServe, the QMS bulletin board, and Q-FAX. Appendix A, "QMS Customer Support," of this document explains how to use these services.

- Printer Option Documentation

  If you purchased a printer option (for example, a direct network interface card), you may have received separate documentation for it. Check chapter 8, "Printer Options," of this manual for additional option information.

- Electronic Information

  CompuServe, the Internet, our bulletin board, and Q-FAX are all sources of information from QMS. Appendix A,

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"QMS Customer Support," of this manual explains how to use these sources.

Don't forget that the documentation for your application, operating system, and network probably contains useful printing information.

Typographic Conventions

`Mixed-Case Courier`	Text you type, and messages and information displayed on the computer monitor
`Mixed-Case Italic Courier`	Variable text you type; replace the italicized word(s) with information specific to your printer or workstation
`UPPERCASE COURIER`	Information displayed in the printer message window
lowercase bold	PostScript operators
lowercase italic	Variable information in text and PostScript variables
UPPERCASE	File and utility names
↵	Press the Enter key (PC) or Return key (Macintosh)
^*X*	Press and hold down the Ctrl key (PC) while you type the following letter.

NOTE: Notes contain tips, extra information, or important information that deserves emphasis or reiteration.

CAUTION: Cautions present information that you need to know to avoid equipment damage or extreme annoyance.

WARNING! Warnings indicate the possibility of personal injury if a procedure is not performed exactly as described in the manual.

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ACHTUNG! Bitte halten Sie sich exakt an die im Handbuch beschriebene Vorgehensweise, da sonst Verletzungsgefahr bestehen könnte.

Printer Features

The following overview acquaints you with the printer's major features and their benefits. Consult the table of contents or index (blue pages) of this manual to find more information on the features.

Color Laser Technology

The *magicolor* LX laser printer features advanced color-laser technology that allows it to produce inexpensive, durable, 300 or 600 dpi prints on plain paper or transparencies, at 3 to 6 color pages and 12 monochrome pages per minute.

QCOLOR Technology

The *magicolor* LX laser printer features QCOLOR, a QMS-developed technology for automatically optimizing color printing, for Windows and Macintosh applications. When enabled, QCOLOR configures the *magicolor* LX for the best output quality based on the contents of the document (for example, text, line art, presentation graphics, photographs, or scans).

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The *magicolor* LX printer also supports device-independent color, either directly or through a color management system, such as Apple's ColorSync and Pantone's POCE. This printer also supports the PANTONE®* MATCHING SYSTEM, the standard model for color reproduction in graphic arts and publishing, to help you see the most accurate PANTONE Color simulations for proofing. Chapter 7, "Optimizing Color Output," contains more information on QMS Automatic Color Control and color management systems.

Multiple Resolutions

If you purchased a printer with 12 MB RAM, you can print color or monochrome documents in 300 dpi or monochrome documents in 600 dpi. You can print color *and* monochrome documents in 600 dpi if you install additional RAM in the printer. The *magicolor* LX ships with either 12 or 24 MB of RAM. See appendix B, "Technical Specifications," for specific information on RAM requirements and color resolution.

Software Loadable System (SLS)

Your printer has a software loadable system, SLS, which allows you to replace or upgrade its system software from a host. Future enhancements to the system software can be easily installed as they become available from QMS.

* Pantone, Inc.'s check-standard trademark for color and color reproduction materials.

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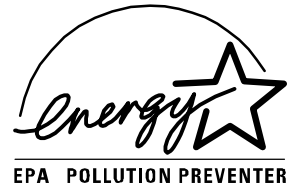
Energy Saver Mode

The *magicolor* LX printer's Energy Saver option allows it to automatically enter a lower-power state after no print jobs have been received for a certain length of time (which you define). The **Energy Star** version of the *magicolor* LX printer (look for an Energy Star label on the back of the printer) is compliant with US Environmental Protection Agency (EPA) Energy Star regulations. The EPA Energy Star Computers program promotes the use of energy-efficient personal computers, monitors, and printers and the reduction of air pollution caused by power generation. See "Administration/Engine/Energy Saver " in chapter 4, "Printer Configuration," for information on Energy Saver options.



NOTE: The addition of some optional interfaces, in some combinations, may cause the product to become non-Energy Star compliant.

QMS Crown Operating System

Your printer features the QMS Crown multitasking printer operating system. Some of its features are

- Multitasking

  The printer receives, compiles, processes, and prints simultaneously, so jobs are printed more quickly and the host is free sooner.

- Simultaneous Interface Operation

  All interfaces are active at the same time, buffering and processing data until pages can be printed, which increases

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throughput. (Each input buffer can be expanded with optional memory.)

- Emulation Sensing Processor Technology

  When in ESP mode (selectable through PS Executive Series Utilities or the control panel), the printer analyzes incoming data and selects the appropriate printer language from those available, so users don't have to set switches or send commands to use different printer emulations. ESP mode works with most popular commercially available applications.

- Context Switching

  After initial use, the state of an emulation and downloaded data (fonts, macros, overlays) is preserved for as long as the printer power is on, so repetitive downloading is unnecessary.

- Compile-ahead Processing

  Pages are compiled into intermediate, compressed blocks of data that can be immediately and more easily rasterized or more efficiently stored for concurrent compiling, rasterizing, and printing. This allows the printer to maintain full print speed under maximum job activity.

- User-configurable Input Buffers

  Printer memory can be configured to enable the most efficient spooling for a particular environment. Chapter 4, "Printer Configuration," contains more information on printer memory.

- Spooling Overflow

  Data is spooled transparently to the internal hard disk, so input buffers aren't limited to RAM capacity.

- Compressed Data Format

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Data is compressed so that entire documents can be stored in the printer, allowing users to take advantage of advanced document handling features such as jam recovery without resending files.

Media Flexibility

With this printer, you can print on plain paper,laser paper, transparencies, labels, envelopes, and thick stock in letter, A4, executive, and legal sizes. Plain paper, economical and widely available, is the ideal choice when adding spot color to reports, newsletters, and other documents. Laser paper, such as Hammermill's Laser Print, allows the richest color output and most consistent coverage (especially for large areas) for the highest quality documents or prepress proofs. See chapter 5, "Print Media and Daily Operations," for detailed information on different media types.

Automatic Jam Recovery

The printer has jam recovery, so that after a jam is removed, the printer automatically reprints the jammed page(s) and finishes the job.

Convenient Control Panel Operation

The keypad and message window on the control panel allow easy access to the Configuration menu, through which you can change printer defaults to suit your needs. The message window and the LEDs indicate printer status. Messages can be displayed in English, French, Spanish, or German. An optional security card allows access through the printer control panel to be password protected, so that only users who know the password can change printer configuration.

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PS Executive Series Utilities

Once you install this software on your host, use its menus to access printer features, such as printer naming and font and emulation downloading. PS Exec also contains sample files that illustrate some of your printer's capabilities. The PS Exec software is accompanied by Macintosh screen fonts and a PC screen printing utility. You can also load new system software through PS Exec. A README file explains how to install PS Executive Series Utilities, and its online help explains how to use the utilities.

PostScript Level 2 Compatibility

The printer's Level 2 emulation is fully compatible with Adobe's PostScript Level 2 page description language, whose features include device-independent color, improved memory and resource management, data compression/decompression filters, and pattern and form caching. Full support (selectable through PS Executive Series Utilities or the control panel) for PostScript Level 1 files is also included in this printer.

Resident HP PCL 5C and HP-GL Emulation

Your printer emulates the HP PaintJet XL300 PCL 5C printer. This emulation supports the complete set of color commands in the XL300, 13 outline typefaces, and 7 PCL Courier and Lineprinter bitmap fonts (see "The Resident HP PCL Fonts" in chapter 7, "Optimizing Color Output," for a font list). It also supports HP-GL/2 vector graphics. This printer also emulates the following HP-GL plotters: 7550A, 7470A, 7475A, and ColorPro.

Intel RISC-based Controller

A 33 MHz Intel 80960CF RISC microprocessor boosts processing speed.

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39 Resident PostScript Fonts

Your printer comes with 39 licensed PostScript fonts. All these fonts have multilingual character sets. See "The Resident PostScript Fonts" in chapter 7, "Optimizing Color Output," for a list.

Printer Options

- Full-color 600 dpi printing in all supported page sizes

  If you upgrade to 28 MB RAM or more, you can print four-color documents in all supported page sizes in 600 dpi. See appendix B, "Technical Specifications," for specific information on RAM requirements and color resolution.

- User-upgradable RAM (Random Access Memory)

  The resident RAM is user-upgradable to as much as 64 MB, which allows your printer's capacities to grow with your needs. Additional RAM expands printing capabilities and can improve system performance.

- Font and Emulation Cards

  Fonts and printer emulations are contained on small printer circuit boards called cards, which can be plugged into slots on the front of the printer. Contact your QMS vendor for a complete list of available cards.

- Direct Network Interface for Ethernet or Token-Ring

  A direct network interface is available for DECnet, EtherTalk, LAN Manager/LAN Server, Novell NetWare, TCP/IP, and EtherTalk on Ethernet networks, as well as LAN Manager/LAN Server, Novell NetWare, and TCP/IP on Token-Ring networks.

- Hard disk expandability

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Your printer comes standard with an upgradable 80 MB internal hard disk. Also, through the resident 25-pin SCSI connector port, the printer's capabilities can be expanded with up to six external hard disks. A hard disk provides storage for a cache of character bitmaps, downloaded outline fonts, and other files.

- 250-sheet Optional Sheet Feeder

  The cassette in the optional sheet feeder can hold up to 250 sheets, which allows you to spend less time refilling cassettes and to use different types of media more conveniently (for example, you could load transparencies in the standard cassette and plain paper in the sheet-feeder's cassette.)

- Envelope Cassette

  You can purchase an envelope cassette from your QMS vendor. This cassette holds up to 30 DL or Com 10 envelopes and fits in the standard or optional media-cassette slot.

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Chapter 2

Initial Printer Setup

Chapter highlights:

- Finding a good location for your printer
- Unpacking your printer
- Installing the developer and toner
- Installing the cleaning pad, oil, bottle, and waste toner pack
- Installing OPC belt cartridge and paper cassette
- Printing a start-up page

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Introduction

This chapter explains how to set up the printer for the first time. For quick information on replacing print media, developer, and toner after the initial setup, see chapters 5 and 6, "Print Media and Daily Operations," and "Consumables and Preventative Maintenance."

NOTE: We recommend that you have the printer set up by a QMS-authorized technician. The instructions in this chapter are provided for people experienced in working with printers, but must be followed carefully to avoid damage to the printer. QMS reserves the right to charge for repairs necessitated by improper installation. See appendix B, "QMS Customer Support," for information on contacting QMS.

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Finding a Good Location for Your Printer

Location Requirements

Your printer should located

- On a hard, level surface (*maximum 1° slant*) capable of supporting the printer weight (approximately 106 lbs/48 kg).
- Away from cooling sources, heating sources, extreme temperature changes, direct sunlight, excessive dust, and corrosive chemicals or vapors.
- Away from any strong electromagnetic field (such as that created by an air conditioner) and excessive vibration.
- In an area with a moderate temperature (64° to 81° F; 18° to 27° C).
- In an area with a relative humidity of 60% to 70%.
- An appropriate distance from the host: less than 6 feet (1.8 meters) for parallel communication, less than 25 feet (7.5 meters) for serial communication.
- Near an electrical outlet.

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- With proper clearance and ventilation area: left side 36" (90 cm), right side 4" (10 cm), front 28" (70 cm), rear 16" (40 cm).
- With enough space for you to open the printer and to access the paper cassette(s). Figure 2.1 illustrates the proper clearance for your printer.

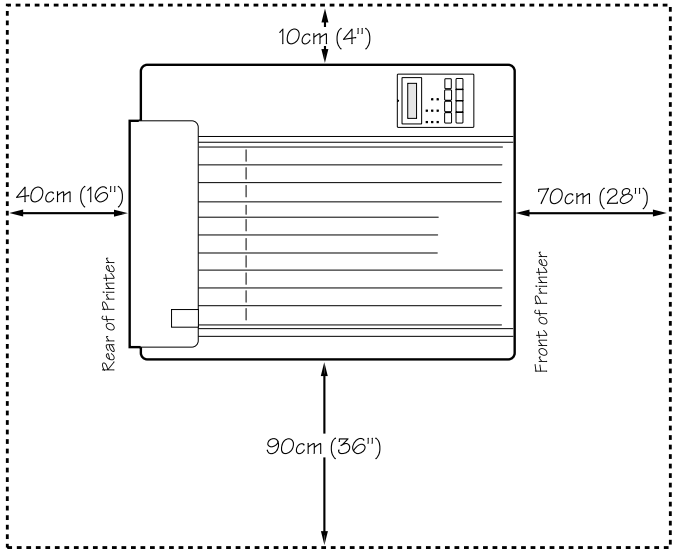

Fig. 2.1 *Printer Clearance*

Power Requirements

Your printer requires a properly grounded (earth connection) 120 volt (±12 volts) outlet. The required frequency is 60 Hz (±2 Hz).

The electrical connection should be direct, not via a branched socket, and should be surge-protected. Noise-generating equipment shouldn't be connected to the same electrical outlet as the printer.

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What's Included in the Shipment

In addition to this manual, your shipment should contain the following items:

- QMS *magicolor* LX printer
- OPC belt cartridge
- 4 developer cartridges (1 each yellow, magenta, cyan, black)
- 4 toner cartridges (1 each yellow, magenta, cyan, black)
- Cleaning pad
- Oil bottle
- Waste toner pack
- Power cord
- PS Executive Series Utilities disks
- Softload system back-up disks (includes printer system software and PostScript fonts on DOS and Macintosh disks, and PCL fonts on a DOS disk).

Interface cables aren't included with the printer. Contact your QMS vendor if you need cables. See chapter 3, "Connecting the Printer," for information on cables, and appendix B, "Technical Specifications," for cable pinouts. If you find any part of the shipment missing or damaged, contact the shipping company or your QMS vendor immediately. Don't return any merchandise to the manufacturer without authorization.

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QMS Product Registration

Register your QMS product now. In the US, call (800) 637-8049 to register. In other countries, see appendix A, “QMS Customer Support,” for the appropriate number.

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Unpacking the Printer

The packing materials that protect the printer during shipment must be removed. You might want to save the packing materials in case you ever have to move or ship the printer.

CAUTION: You may damage the printer if you turn it on before all packing materials are removed.

WARNING! The printer weighs approximately 106 lbs (48 kg) without consumables. Do not attempt to lift it by yourself.

ACHTUNG! Der Drucker hat ein Gewicht von ungefähr 48 kg. Bitte versuchen Sie niemals, den Drucker alleine anzuheben oder zu transportieren.

1. Remove everything except the printer from the shipping carton (fig. 2.2).
2. With the assistance of another person, grasp the printer by the four ridged finger grips (two on each side of the printer) and lift it out of the carton and remove the plastic wrap (fig. 2.2).

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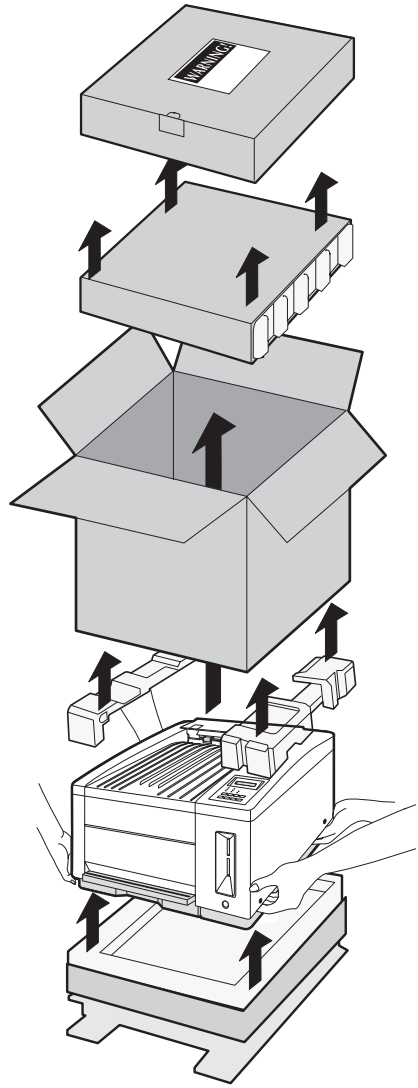

Fig. 2.2 *Unpacking the Printer*

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3. Before you begin setup, take a few minutes to look over figures 2.3 and 2.4. They provide a quick overview of the exterior parts of your printer.

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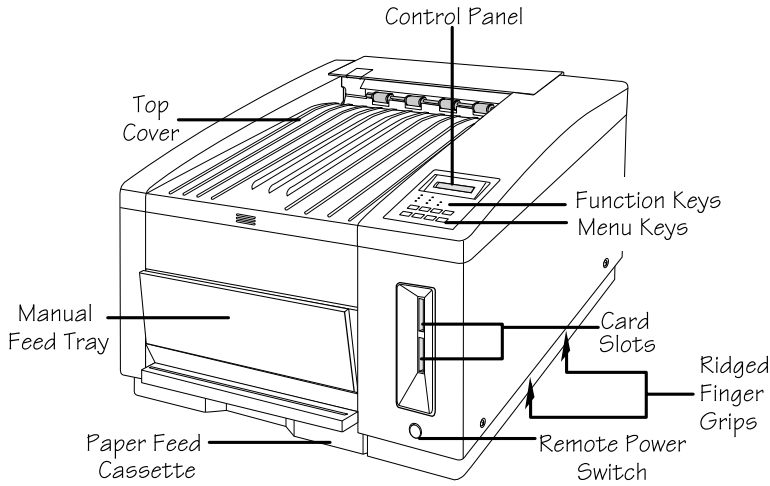

Fig. 2.3 *Front View of the Printer*

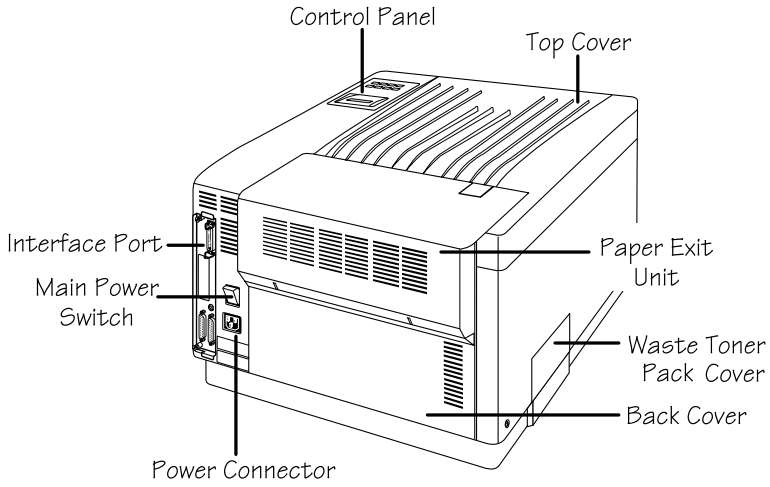

Fig. 2.4 *Back View of the Printer*

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4. Remove the two polystyrene inserts from the top cover of the printer.
5. Remove all packing tape from the exterior of the printer.
6. Grasp the front end of the top cover and lift it up to remove it (fig. 2.5). Then, set the cover aside for now.

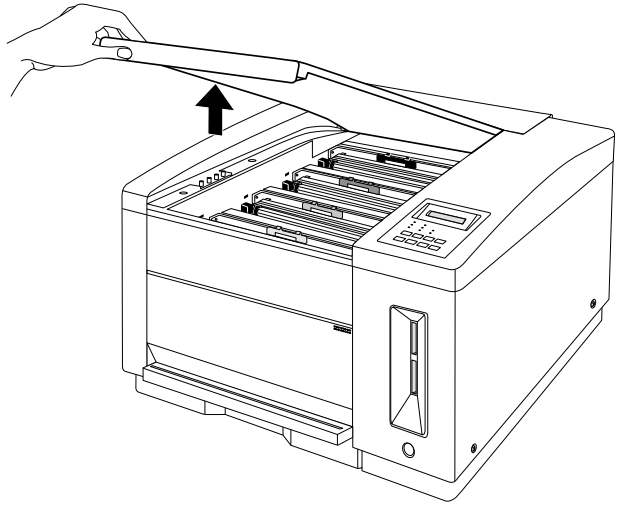

Fig. 2.5 *Remove the Top Cover (front view)*

7. Remove the two polystyrene shipping spacers from inside the printer.

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Installing Developer and Toner Cartridges

When you load developer and toner cartridges, the colors must be in a set order from the back of the printer to the front. Black should be loaded in the slot closest to the rear of the printer, followed by cyan, then magenta, and finally yellow in the front slot.

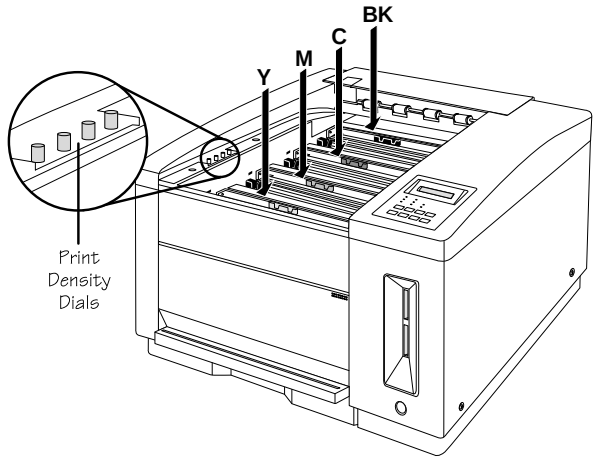

Fig. 2.6 *Cartridge Loading Order (front view)*

WARNING! The developer and toner are highly combustible powders; never burn them. Also, avoid inhaling loose developer or toner or getting them around your eyes; they can cause respiratory problems and eye irritation.

ACHTUNG! Bei Entwickler und Toner handelt es sich um gefährliche Pulver, die leicht entzündlich sind; sie dürfen deshalb niemals mit offenem Feuer in Berührung kommen. Einatmen oder Berührung mit Haut und Augen ist ebenfalls zu vermeiden, da dieses zu Beeinträchtigungen der Atemwege, Haut oder Augenreizungen führen könnte.

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CAUTION: The same color developer and toner cartridges must always be loaded in the same place on the printer. To prevent accidental mixing of colors, each toner cartridge has pins that are keyed to fit only the developer cartridge of the corresponding color. Never force a toner cartridge onto the wrong developer cartridge. This can damage the cartridges and the printer.

NOTE: A developer cartridge must be installed before the toner cartridge of the same color.

1. Remove the developer cartridge from its protective bag, starting with the black cartridge. (The developer cartridges are color-coded on their tops.)

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2. Grasp the two green latches, one at each end of the cartridge, and raise them straight up (fig. 2.7) to open them.

3. Holding the developer cartridge by the green latches, gently lower it into the open cartridge slot closest to the back end of the printer until it seats firmly under the securing latches (fig. 2.7).

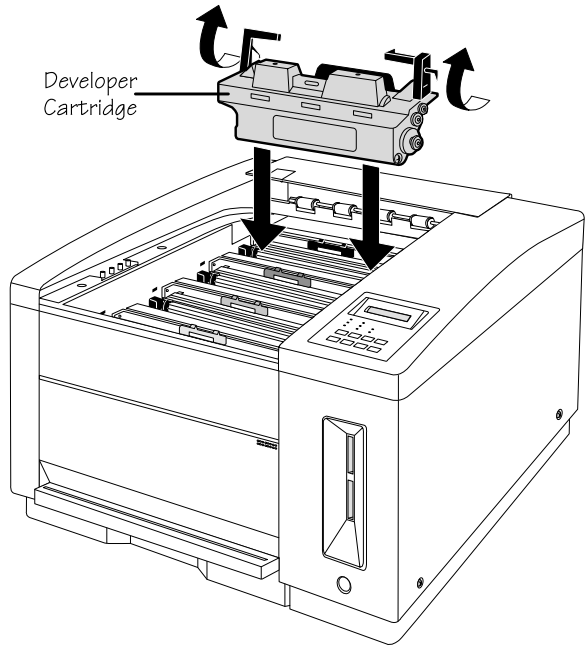

Fig. 2.7 *Load Developer Cartridge (front view)*

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4. Close the green latches by pushing them forward and down to hold the developer cartridge in place (fig. 2.8).

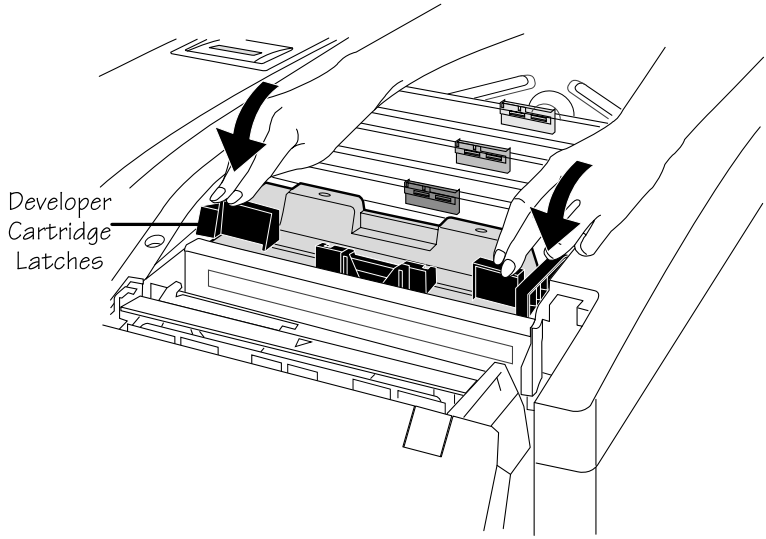

Fig. 2.8 *Close Latches (rear view)*

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5. Grasp the tab on the top of the developer cartridge. Pull the tab and attached clear tape straight up and out of the cartridge, making sure the tape comes completely out (fig. 2.9). Then, discard the tab and tape.

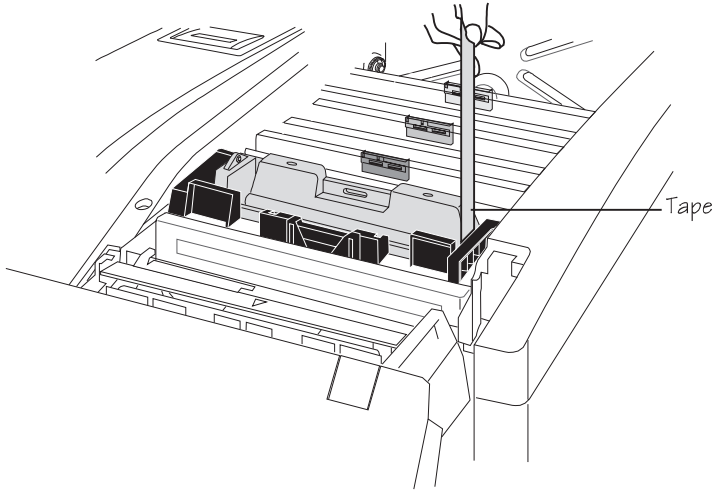

Fig. 2.9 *Remove Sealing Tape (rear view)*

6. Locate the toner cartridge that matches the color of the developer cartridge just installed, and remove it from its protective bag. (Toner cartridges are color-coded—black, cyan, magenta, or yellow—on the top.)

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7. Hold the toner cartridge as shown in figure 2.10, and shake it horizontally. This distributes toner evenly inside the cartridge and helps assure quality printing.

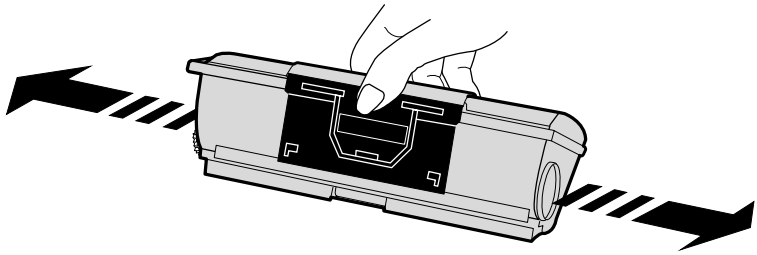

Fig. 2.10 *Distribute Toner in Cartridge*

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8. Hold and squeeze the toner cartridge across the center (fig. 2.11), and align it with the developer cartridge of the same color. Make sure the pins on the back side of the toner cartridge line up with the notches on the developer cartridge.

CAUTION: Never force a toner cartridge onto the wrong developer cartridge. Not only will this damage the cartridges, but also the pressure can damage the printer.

9. Lower the toner cartridge until it fits firmly onto the notches on the developer cartridge (fig. 2.11).

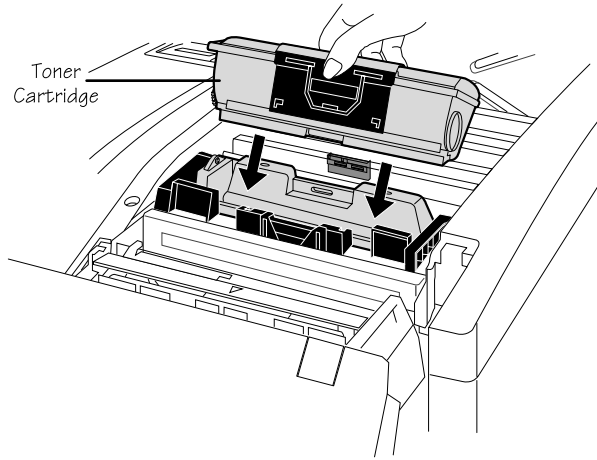

Fig. 2.11 *Align Cartridges (rear view)*

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10. Press the top of the toner cartridge until the cartridge latches securely in place.

11. Grasp the tab on the top of the toner cartridge.

12. Hold the toner cartridge in place with one hand as you pull the tab and attached clear tape straight up and completely out of the cartridge (fig. 2.12) using the other hand. Then discard the tab and tape.

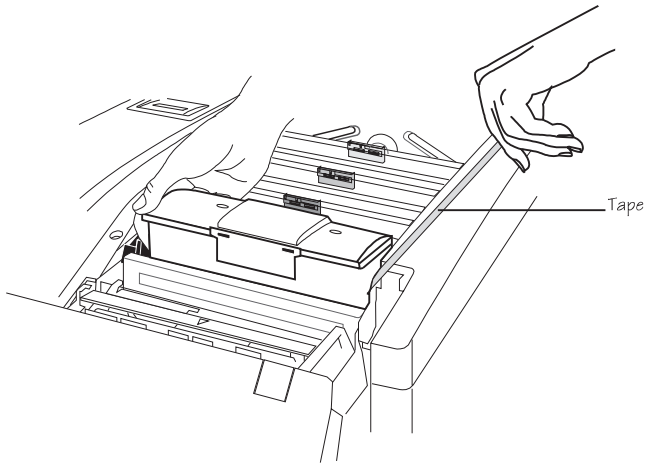

Fig. 2.12 *Remove Sealing Tape (rear view)*

13. Repeat steps 1-12 to load the cyan, then the magenta, and finally the yellow developer and toner cartridges, making sure each toner cartridge is loaded onto the corresponding developer cartridge.

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When you finish, the black cartridges should be in the last slot toward the back of the printer, then the cyan in the next slot, the magenta in the third slot coming forward, and the yellow in the front slot.

After the toner and developer are installed, you need to remove the pressure-release pieces.

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Removing the Pressure-Release Pieces

Two pressure-release pieces help relieve tension on the fuser rollers to protect the rollers from accidental damage during shipment. These pieces must be removed before printing. Use the following procedure to remove these pieces:

1. With the top cover still off, pull up on the paper exit unit latch and then tilt the unit back and down to open it (fig. 2.13).

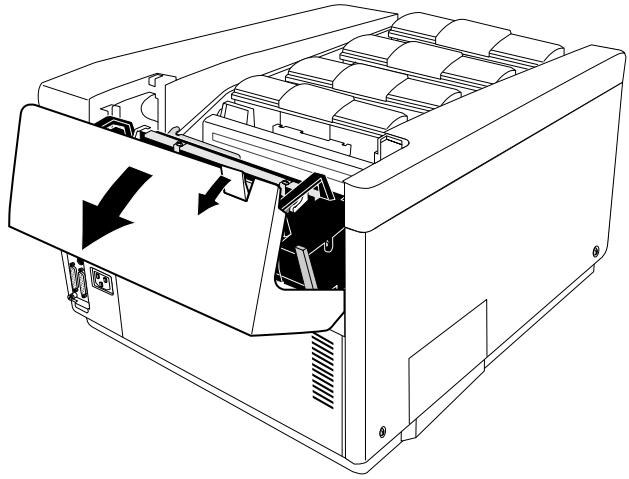

Fig. 2.13 *Open the Paper Exit Unit (rear view)*

2. Pull back the two latches (one on each side) of the separator pawl unit to unlock it. Then, tilt the pawl unit back in the direction of paper exit unit at the back of the printer (fig. 2.14).

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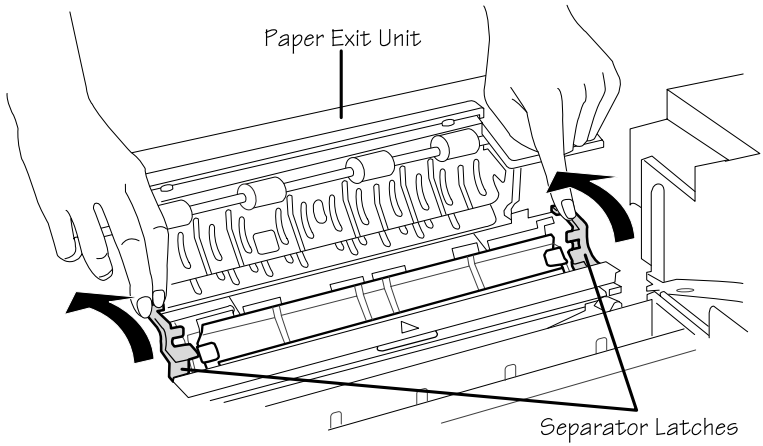

Fig. 2.14 *Open Separator Pawl Unit (front view)*

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3. Open the pressure-release lever on the end of the fuser unit (fig. 2.15).

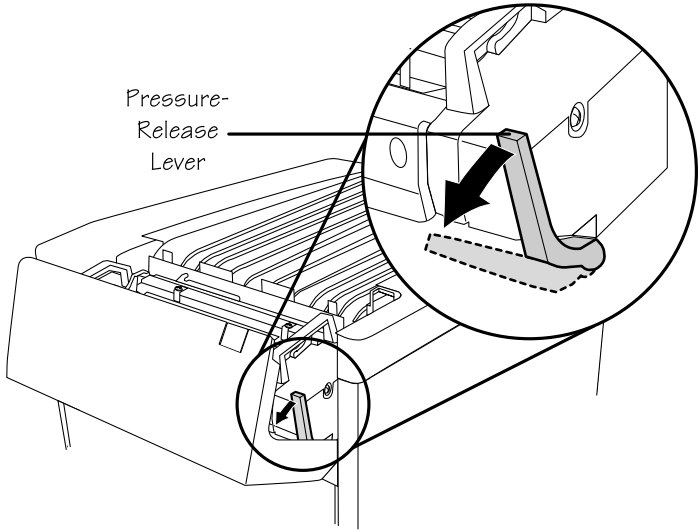

Fig. 2.15 *Open the Lever (rear view)*

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4. Grasp the tab end of one of the green pressure-release pieces and gently pull it up and out of the printer (fig. 2.16). Remove the piece at the other end of the fuser roller in the same manner.

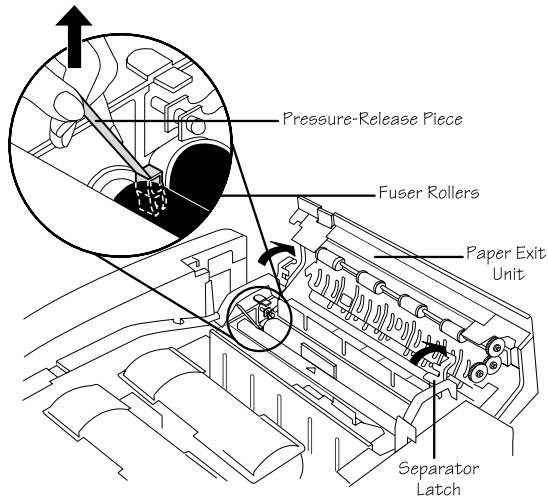

Fig. 2.16 *Remove Both Pieces (front view)*

5. Store the two pressure-release pieces in a safe place.

   NOTE: You need to reinstall both pieces if you move the printer farther than just across a table or from one side of a room to another—especially if the printer may not remain level or may be jostled. See "Moving your Printer" in chapter 6 for details on replacing these pieces. Also, reinstall both pieces if the printer will not be used for 2 weeks or more.

6. Close the pressure-release lever on the end of the fuser unit.

Once the pressure-release pieces are removed, you need to install the cleaning pad and oil bottle.

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Installing the Cleaning Pad and Oil Bottle

The cleaning pad removes printing debris (such as excess toner and paper dust) from the fusing unit. The oil keeps toner from sticking to the fuser rollers. Instructions for installing the cleaning pad and oil bottle are given in this section. Replacing the cleaning pad and oil bottle are covered in chapter 6, “Consumables and Preventative Maintenance.”

To install the cleaning pad and oil bottle

1. Remove the cleaning pad and oil bottle from their protective bags.

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2. Holding the cleaning pad by its center tab, align the center of the tab with the triangle mark on the printer (tab-side away from the triangle) (fig. 2.17).

3. Slide the pad into the slot above the heat roller (fig. 2.17). The pad is correctly positioned when it is centered snugly in the slot.

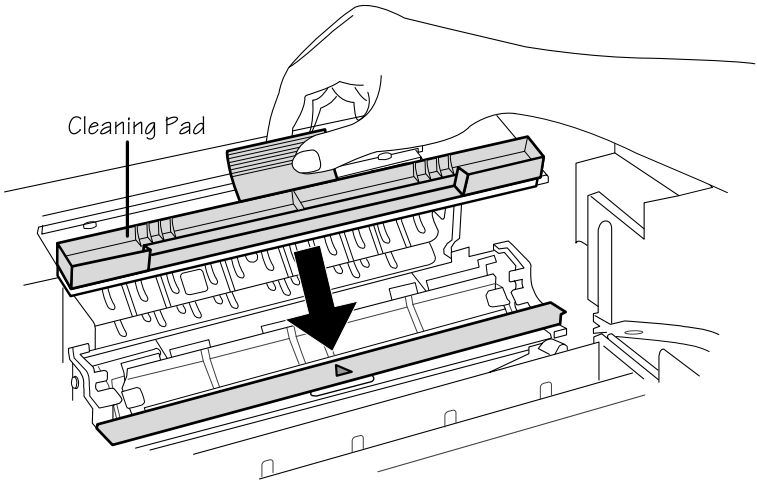

Fig. 2.17 *Install the Cleaning Pad (front view)*

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4. Snap the separator pawl unit closed (fig. 2.18).

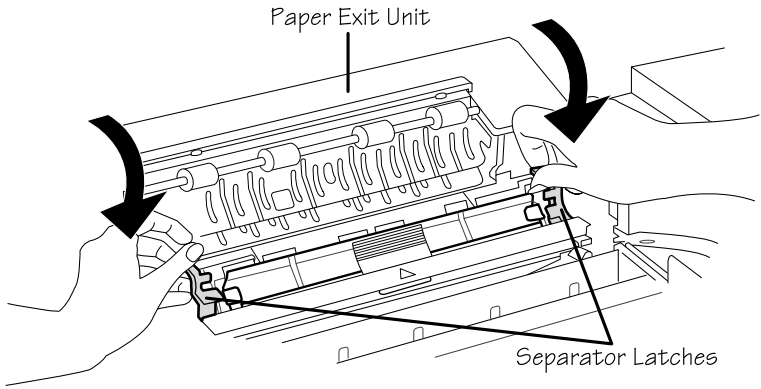

Fig. 2.18 *Close Separator Pawl Unit (front view)*

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5. Pull open the spring latch on the outer edge of the oil bottle retainer, and lift the retainer up and toward the center of the printer (fig. 2.19).

   NOTE: The spout of the oil bottle has a seal to prevent oil from spilling until the bottle is installed on the pin in the fuser slot.

6. Hold the bottle, spout end down with the label facing the printer's front, over the slot in the top of the fuser unit (fig. 2.19).

7. Lower the bottle into place, making sure the spout on the bottom of the bottle aligns with the pin in the fuser slot. The bottle is positioned correctly when it fits snugly in the slot and is flush with the top of the fuser unit.

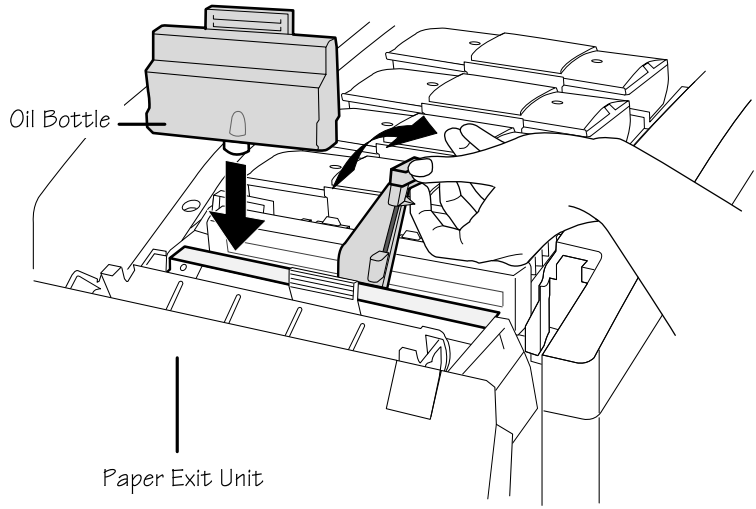

Fig. 2.19 *Install the Oil Bottle (rear view)*

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8. Close the oil bottle retainer, making sure the latch snaps back in place.
9. Close the paper exit unit (fig. 2.20).

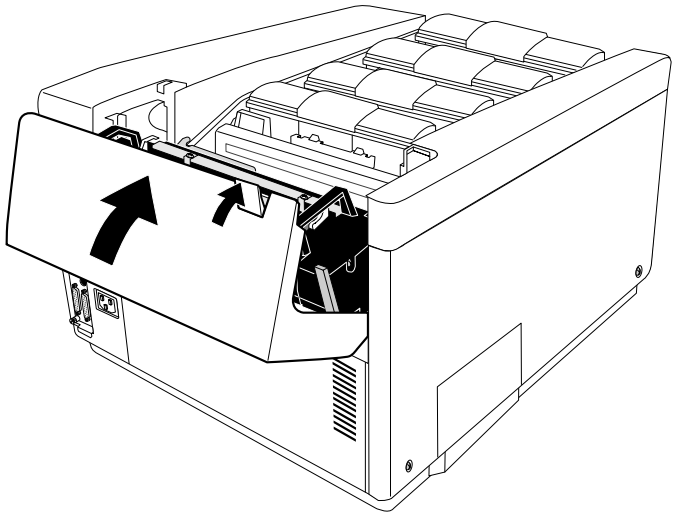

Fig. 2.20 *Close the Paper Exit Unit (rear view)*

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10. Replace the top cover (fig. 2.21).

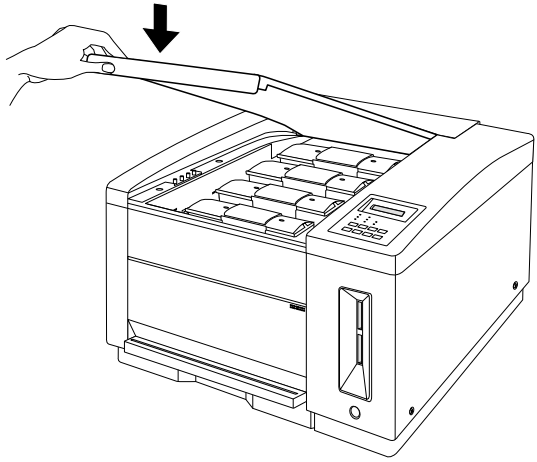

Fig. 2.21 *Replace the Top Cover (front view)*

Now install the waste toner pack. The next section covers this process.

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Installing the Waste Toner Pack

NOTE: For information on replacing a used waste toner pack, see chapter 6, "Consumables and Preventative Maintenance."

To install the waste toner pack

1. Remove the waste toner pack from its protective bag.
2. Follow the instructions accompanying the pack for assembling it, being careful not to puncture the bag.
3. Open the waste toner door by pushing the cover on the top-right corner (fig. 2.22).

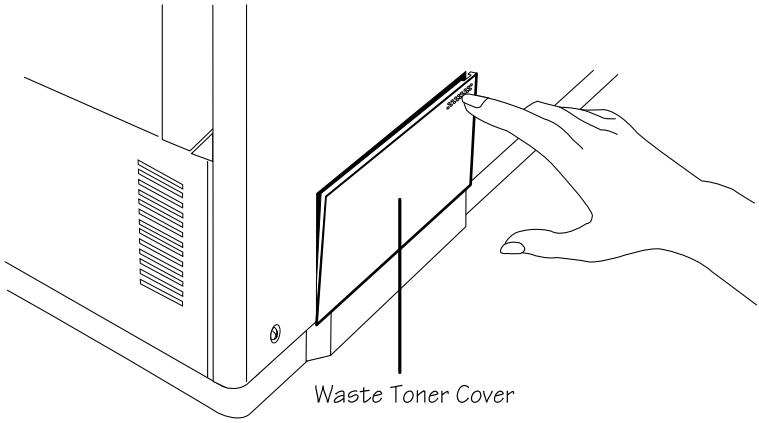

Fig. 2.22 *Open the Waste Toner Door (side view)*

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4. Holding the waste toner pack by the side tab, insert the pack into the printer until it fits securely (fig. 2.23). Then, lift up slightly on the tab to be sure the pack is level and centered.

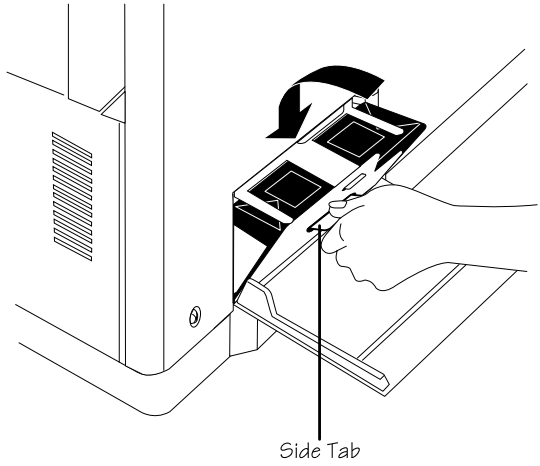

Fig. 2.23 *Insert the Waste Toner Pack in the Printer*

5. Close the waste toner door.

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Installing the OPC Belt Cartridge

This section covers installing the OPC (Organic Photoconductor) belt cartridge into your printer. See “How Your Printer Works” in appendix D for details on the role the OPC belt plays in printing. Replacing the cartridge is covered in chapter 6, “Consumables and Preventative Maintenance.”

To install the OPC cartridge

1. Open the manual feed tray (fig. 2.24) by pushing the top-right corner to release the spring latch.

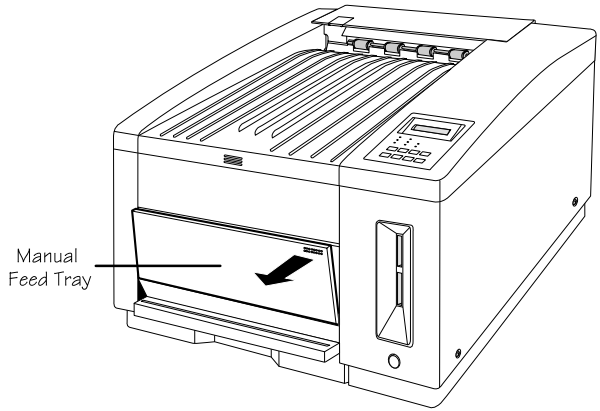

Fig. 2.24 *Open the Manual Feed Tray*

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CAUTION: The OPC belt is extremely sensitive to bright lights and direct sunlight. Do not remove the cartridge from its protective bag until you are ready to install it. Limit exposure to light of 800 lux (the average fluorescent lighting in an office) to under 2 minutes. If exposure exceeds this, put the belt into a dark place, like inside the printer, to recover; depending on exposure, recovery may take up to 2 hours.

Also, handle the belt cartridge carefully. The belt is extremely sensitive to hand oils and scratches, both of which will reduce print quality.

2. Remove the OPC belt cartridge from its protective bag.

   NOTE: Be sure to save the protective bag to use during printer cleaning and maintenance when the OPC belt cartridge is out of the printer.

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3. Remove the pressure release and tension release pin sets (one set on the left and one on the right) from the OPC belt cartridge (fig. 2.25).

   NOTE: The pressure release and tension release pins protect the belt and its cleaning blade by relieving tension during shipment. Save these pins to reinstall them if you need to ship the printer later.

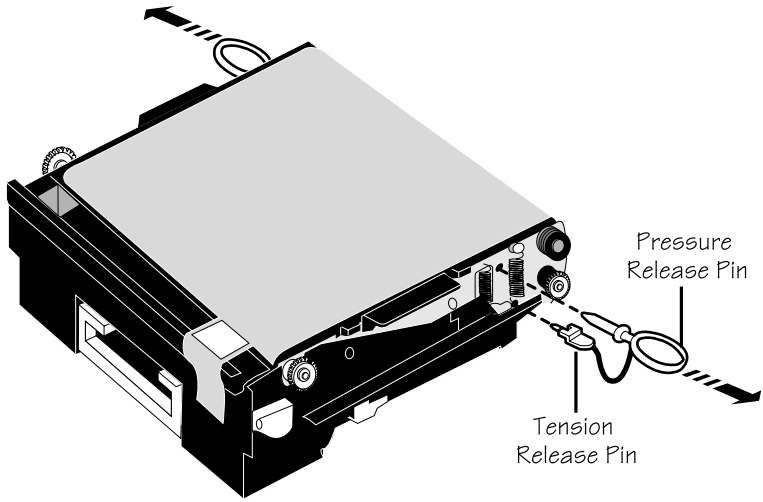

Fig. 2.25 *Remove the Release Pins*

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4. Make sure the green handle on the end of the OPC belt cartridge is turned up (unlocked).

5. Slide the cartridge three-quarters of the way into the printer until the notches on each side of the bottom rest on the lip of the manual feed tray (fig. 2.26).

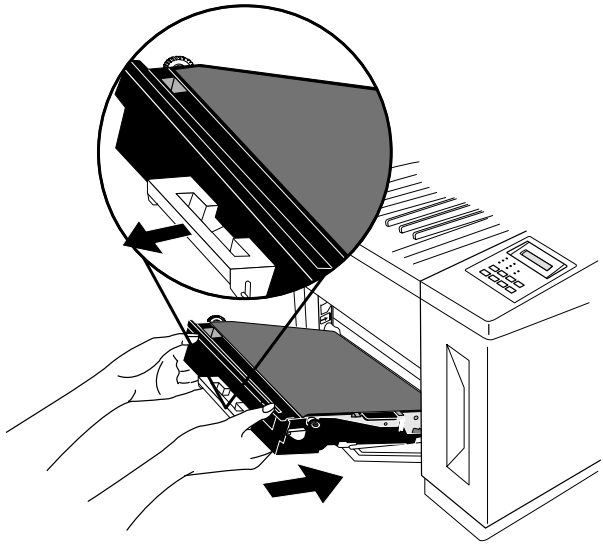

Fig. 2.26 *Slide Cartridge Partially into Printer*

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6. Remove the black light-shield paper from the OPC belt by pulling the tab on the front as shown in figure 2.27 and pulling the paper straight out of the printer.

   NOTE: If the light-shield paper doesn't slide out easily or if it should begin to tear, pull the OPC belt cartridge a little farther out of the printer and try again.

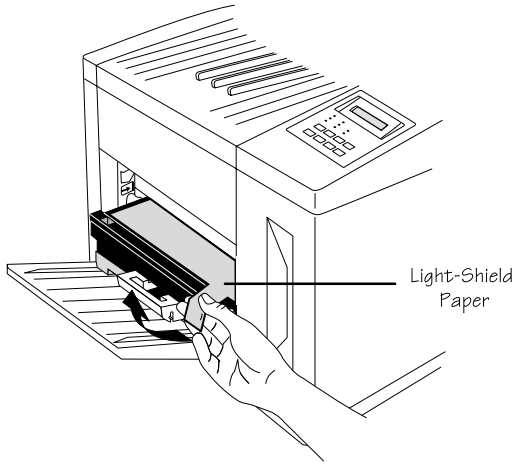

Fig. 2.27 *Remove the Light-Shield Paper*

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7. Firmly slide the cartridge the rest of the way into the printer until it snaps into place. It is in place when you can see the green arrows inside the metal frame of the printer.
8. Turn the green end-handle on the cartridge down to close it and lock the cartridge in place.
9. Close the manual feed tray (fig. 2.28).

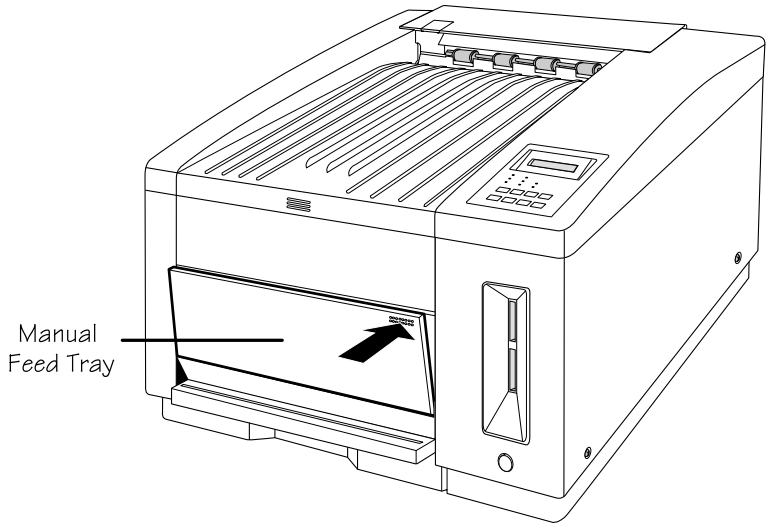

Fig. 2.28 *Close the Manual Feed Tray*

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Filling the Paper Cassette

Instructions are given here for loading and printing on letter- or A4-size paper. Chapter 5, “Print Media and Daily Operations,” has instructions for refilling the cassette, for printing on other media types and sizes, and for inserting media manually. Chapter 5 also contains information about margins and imageable areas.

1. Pull the paper cassette out of the printer (fig. 2.29).

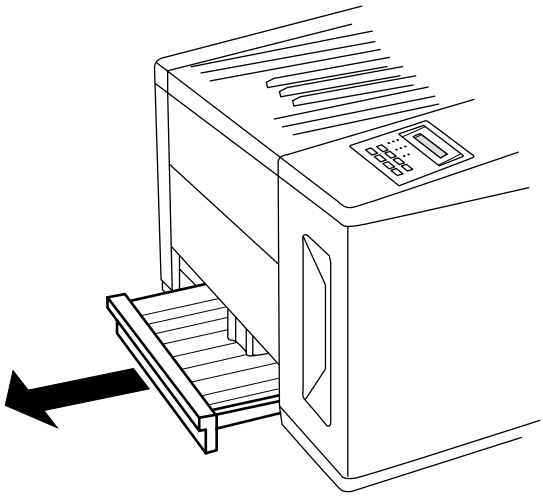

Fig. 2.29 *Remove the Paper Cassette*

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2. Make sure the size key slide on the back end of the cassette is set for letter- or A4-size media (fig. 2.30).

   NOTE: The printer comes from the factory configured to print on letter- or A4-size media. If you want to print on a different size media, see “Refilling the Media Cassette” in chapter 5 for information. Also, see chapter 4, “Printer Configuration,” for information on setting size through the control panel.

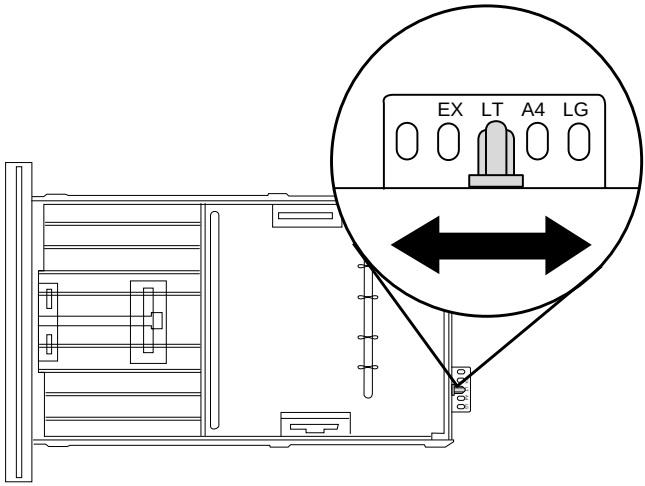

Fig. 2.30 *Check the Cassette Size Key Slide*

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3. From the paper wrapping, determine which is the printing side of the paper (an arrow points in the direction of the printing side on most wrappers). Then remove a stack of paper approximately 1"/27 mm (250 sheets) or less.

   NOTE: Make sure the paper is in good condition, free of such things as folds, tears, or wrinkles.

4. Fan the paper (fig. 2.31) to prevent the sheets from sticking together. Align the edges of the stack on a flat surface.

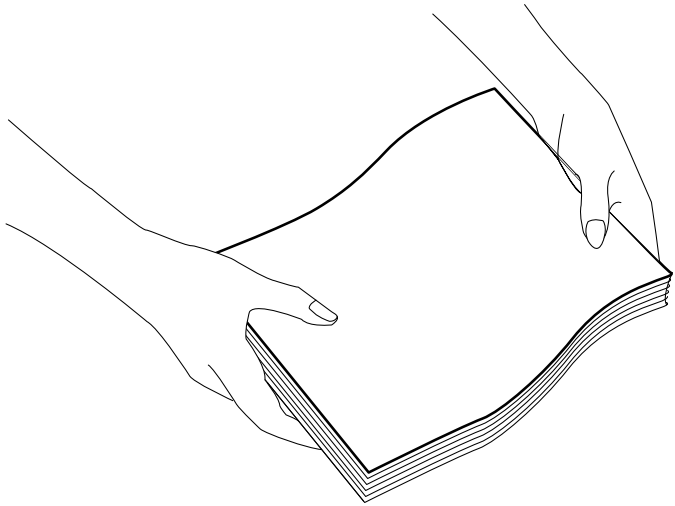

Fig. 2.31 *Fan the Paper*

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5. Load the paper printing-side up in the cassette, top end first for letterhead or preprinted media. (Printing on the wrong side may reduce print quality.) Make sure the paper lies flat and does not exceed the upper-limit mark on the cassette for foil (transparencies) or paper (fig. 2.32). Overloading the cassette can cause a jam.

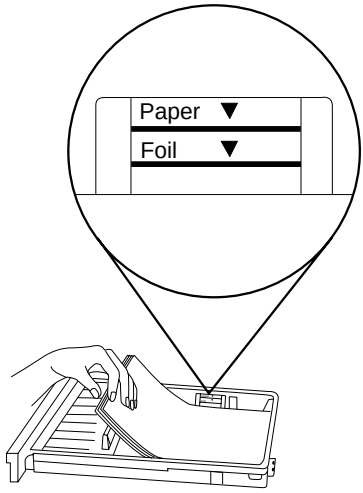

Fig. 2.32 *Load the Paper*

6. Adjust the paper guides on each side and on the trailing edge of the media so that they rest lightly against the media without causing it to buckle.

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7. Slide the filled cassette into the printer (fig. 2.33) until it snaps firmly into place and is flush with the front of the printer.

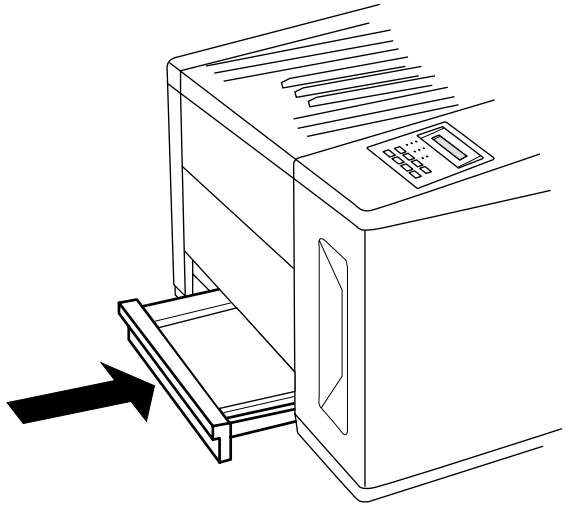

Fig. 2.33 *Slide the Cassette into the Printer*

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Starting the Printer

After you have unpacked the printer and installed the consumables, you need to connect the power cord and turn on the two power switches.

Connecting the Power Cord

The power connector is on the back of the printer on the lower-left side.

CAUTION: Make sure that the main power switch on the back of the printer is off (the O is pressed down). Make sure the remote power switch on the front is off (the button is out).

1. Connect one end of the power cord to the rear of the printer (fig. 2.34).

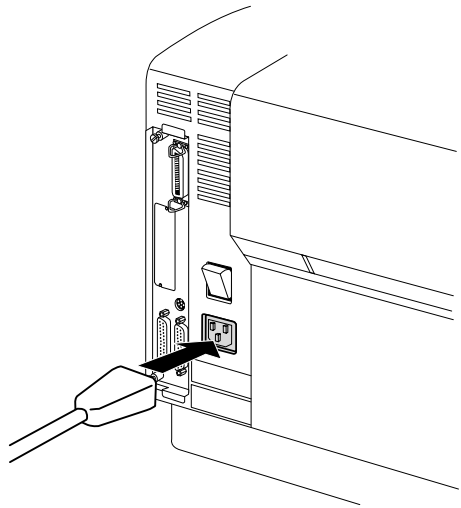

Fig. 2.34 *Connect the Power Cord*

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2. Connect the opposite end of the power cord to a grounded, surge-protected, electrical outlet.

Using the Power Switches

There are two power switches on your printer, a main switch on the rear and a remote switch (for convenience) on the front. Only one switch has to be off to turn off the printer; however, both switches must be on to turn on the printer. Turn on the back switch by setting it to the on (|) position. Turn on the front switch by pressing it in.

CAUTION: If the printer won't be used for several days (such as over a weekend), or if any maintenance work is done, make sure at least one of the power switches is off. This reduces wear and extends the life of the fuser.

When first turned on, the printer goes through an initialization warm-up and self-testing period of approximately 4 minutes. Close to the end of this process, the printer produces a start-up page (see the next section for information on the start-up page). When warm-up is complete, `IDLE` displays in the message window.

NOTE: If the start-up page does not print, see chapter 9, "Troubleshooting." Make sure you wait long enough for the initialization process to finish.

The Start-up Page

When you initially turn on your printer, a start-up page prints in approximately 4 minutes. This page gives basic information about the printer, such as the printer's name, the PostScript emulation level and version, and various printer settings. For a detailed list of

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what the start-up page includes, see "The Start-Up Page" in chapter 5.

If the start-up page prints, and the print quality is good, go to chapter 3, "Connecting the Printer."

Otherwise, see chapter 9, "Troubleshooting," for more information, and be aware of the following warning.

WARNING! Be sure to turn the printer off (both switches), and then unplug it before checking your installation.

ACHTUNG! Bitte schalten Sie unbedingt den Drucker aus und ziehen Sie den Netzstecker heraus bevor Sie die korrekte Installation des Druckers überprüfen.

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Installing Options

If you purchased any printer options, such as extra memory or emulations, install these now. If installation instructions are included with the option, follow those, and be sure to check for additional instructions in chapter 8, “Printer Options.” Then return to chapter 3, “Connecting the Printer,” to finish setting up your printer.

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Chapter 3

Connecting the Printer

Chapter highlights:

- Connecting to a network
- Connecting to a Macintosh
- Connecting to a PC
- About printer communication modes

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Introduction

This chapter explains how to connect your printer to a host computer after you have set it up according to the instructions in the previous chapter, "Initial Printer Setup."

Connecting to a Network

If you've purchased a network interface for your printer, see chapter 8, "Printer Options," for installation information, and see your network and your interface kit documentation for further details.

About Macintosh Networks

If you're connecting to a print network such as TOPS or AppleShare using LocalTalk-type connectors and boxes, see your Macintosh and network documentation for details specific to your setup.

All Macintosh users on a network must use the same version of LaserWriter to run correctly. For example, if the network has a mixture of LaserWriter 7.0 and 8.*x*, it will experience frequent reinitialization problems. Also, to get color output, you must use LaserWriter and Laser Prep 6.0 or higher. (**System 6** users must also all have the same version of Laser Prep unless they're using LaserWriter 6.1 or higher.) Check the version number by selecting the LaserWriter icon, then holding down the Command key while pressing the letter I. The driver version number appears in the Info window.

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Connecting to a Macintosh

What You Need

To connect your printer to a single Macintosh, you need the items shown in the illustration below:

- Two PhoneNET-type transformer boxes

  You need one with a DIN-8 connector for the printer port and one with the connector required by your Macintosh (usually a DIN-8).

- RJ11 (telephone) cable
- Terminating resistors—probably two

If you're replacing a printer already connected to a Macintosh, you probably already have this equipment.

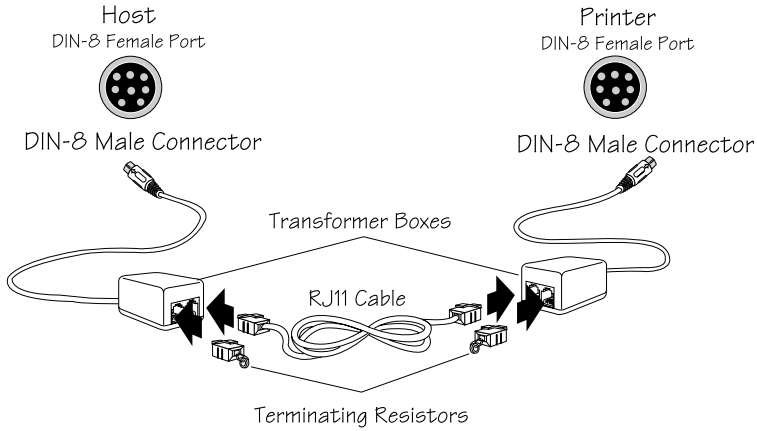

Fig. 3.1 *Macintosh-Printer Interface Cables and Port*

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NOTE: If you're connecting more than one Macintosh to the printer, in an AppleTalk network, see your PhoneNET and Macintosh documentation for information.

Making the Connection

CAUTION: Turn off both the printer and the Macintosh before making the connection.

1. Plug the connector from one transformer box into the printer's LocalTalk port.
2. Plug the connector from the other transformer box into the Macintosh.
3. Connect the two transformer boxes with the telephone cable.
4. Put terminating resistors into any open sockets in the transformer boxes. This ensures proper communication between the Macintosh and the printer and helps speed up data transmission.
5. Turn on the printer.

Printing from the Macintosh

If your Macintosh was previously connected to a PostScript printer, you can probably start printing now. See your application documentation for instructions on sending a document to the printer or see "Testing Macintosh Communication," later in this chapter.

However, to take advantage of all your printer's special features (like QCOLOR automatic color control technology, and media size and type selection), **or** if you've never printed to a PostScript printer before, you need to take a few minutes to load the following software from the Macintosh disks we shipped with your printer:

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- PS Executive Series printer utilities

  PS Exec is a utilities software package for controlling the printer from the Macintosh. For example, through PS Exec you can turn off the start-up page, install printer-resident screen fonts, rename the printer, download fonts, manage hard disks, and print font samples. Many of the procedures described in this manual involve using PS Exec.

- LaserWriter 8.*x* and the *magicolor* LX 4.1 PPD file

  Although your Macintosh system software came with a LaserWriter driver, we recommend you install LaserWriter 8.*x* and the *magicolor* LX PPD (a printer description file) so you can take advantage of special printer features (like QCOLOR automatic color control technology, and media size and type selection).

- Application-specific printer files

  If you plan to print from Aldus PageMaker, Aldus FreeHand, Aldus PrePrint, Adobe Separator, or QuarkXPress, you'll also want to install the latest printer description file (PPD, PDX, or PDF) for your particular software. (You can probably print without them, but you may not be able to access all your printer's features, and you may get an error message telling you to change the printer name.)

Installing the Printer Utilities

1. Insert the Macintosh Format PS Executive Series Utilities disk in your Macintosh.
2. Double-click the PSExec3.*xx*.sea file.
3. In the window that appears, choose Continue.
4. In the window that appears, specify a folder to install the utilities to and choose Save.

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5. After all the files are extracted, choose Quit.
6. Open the Utilities folder in the PSExec 3.*xx* Folder and double-click PSInstall to personalize the program.
7. Double-click the PSExec icon to run the program.

   Check the README file for updates, and see the PS Exec Help for information on using the program.

Installing LaserWriter 8.*x* and the *magicolor* LX 4.1 PPD

1. If you haven't already, follow the instructions given above in "Installing the Printer Utilities."
2. Make backup copies of your current LaserWriter drivers and the contents of your Printer Descriptions folder. (If you use **System 7**, these files are stored in the Extensions folder in your System Folder. If you use **System 6**, these files are stored in the System Folder.)
3. Delete your LaserWriter 8 preferences files. (If you use **System 7**, this file is stored in the Preferences folder in your System Folder. If you use **System 6**, this file is stored in the System Folder.)
4. Open the PSExec 3.*xx* Folder, then the Drivers folder, then the LaserWriter folder to display the LaserWriter 8.*x* icon (among other things).
5. Drag the LaserWriter 8.*x* icon to your current System Folder. (The system knows where to copy it. If you're prompted for permission to copy the file to the folder, choose OK.)
6. **System 7 users:** Create a folder called Printer Descriptions inside the Extensions folder inside the System Folder, if one doesn't already exist.

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System 6 users: Create a folder called Printer Descriptions inside the System Folder, if one doesn't already exist.

7. Open the PPDs folder inside the Drivers folder in the PSExec 3.*xx* Folder.
8. Open the Ver 4.1 folder inside the PPDs folder.
9. Select the *magicolor* LX PPD in the Ver 4.1 folder and drag it to the Printer Descriptions folder you created in step 4.
10. From the Apple menu, choose Chooser.
11. In the Chooser window, select the LaserWriter 8.*x* icon and select the QMS *magicolor* LX.
12. Choose the Setup button.

    This causes the LaserWriter to query the printer and automatically choose the appropriate PPD.
13. Exit the Chooser.

    Now, when you go into your application, you can access QMS printing options (like QCOLOR color control) by choosing Options in your application's Print dialog box. For information on the printer-specific features in the Options dialog box, see chapter 7, "Optimizing Color Output."

Note for Users of Aldus Applications

If you use an Aldus application, when you want to print, hold down the Option key while selecting Print from the File menu. This brings up the LaserWriter window, which contains the QMS printing options like QCOLOR color control. (Normally, Aldus applications bypass LaserWriter and use an Aldus printer driver, which would prevent you from accessing QMS color printing options.)

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Note for Adobe Photoshop Users

If you use **Adobe PhotoShop**, go to PhotoShop's Page Setup dialog box, and select Use Printer's Default Screen under the Screens option. (This allows your choices in the QMS driver to take effect.)

Installing Printer Description Files

If you plan to print from Adobe Separator, Aldus PageMaker, Aldus FreeHand, Aldus PrePrint, or QuarkXPress, install the appropriate printer description file (PPD, PDX, and/or PDF) as described below:

NOTE: The application should be installed before you install the printer description file(s).

1. If you haven't already, follow the instructions given above in "Installing the Printer Utilities."
2. Install the appropriate printer description file(s) for your application from the Drivers folder in the PS Exec folder:

If you use Adobe Separator, install the PPD file. Your Separator documentation explains where to put it.

If you use Aldus PageMaker 5.*x*, install the version 4.1 PPD in the Printer Descriptions folder.

If you use Aldus PageMaker 4.*x*, install the version 3.0 PPD and PDX files in the PPDs folder in the Aldus folder in the System Folder.

If you use Aldus FreeHand 4.*x*, install the version 4.1 PPD in the Printer Descriptions folder.

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If you use Aldus FreeHand 3.*x*, install the version 3.0 PPD and PDX files in the PPDs folder in the Aldus folder in the System Folder.

If you use Aldus PrePrint, install the version 3.0 PPD and PDX files in the PPDs folder in the Aldus folder in the System Folder.

If you use QuarkXPress, install the *magicolor* LX PDF in the same folder as QuarkXPress. QuarkXPress 3.3 allows you to access either a PDF or a PPD, but in order to have access to all of your printer's features, we recommend that you use the PDF. To select the PDF, go to Quark's Page Setup dialog box and hold down the Shift key while clicking the Printer Type listbox. (The selections that appear italicized are PPDs and the selections that appear non-italicized are PDFs.) Also in the Page Setup dialog box, make sure the EFIColor profile selection is "None."

Note that the Quark LPI setting you choose determines which printer halftone settings are used. The table below shows which printer halftone setting is used for each Quark LPI setting:

LPI	**Halftone**
15 to 44	Printer default
45 to 54	53 lpi x 45 degrees
55 to 79	71 lpi x 45 degrees
80 to 89	80 lpi x 45 degrees
90 to 99	Enhanced
100 to 125	106 lpi x 45 degrees
126 and higher	Printer default

Testing Macintosh Communication

You can test communication between the printer selected in the Chooser and the Macintosh by sending a file to the printer from an application (see your application documentation for more information), or by printing a directory, as described here:

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1. Display a disk or folder window.
2. From the File menu, choose Page Setup. Select paper size, printing orientation, and any other necessary options. Then select OK.
3. From the File menu, choose Print Directory or Print Window. A dialog box appears.
4. Select the printing options you want, then click Print or OK. (Choose the Save button to save your settings for future print jobs.) A directory prints. (If no page prints, check chapter 9, "Troubleshooting.")

Where to Go Now

You're now ready to print from your Macintosh.

From this point, you'll probably perform most printing tasks from your application. For specific information, check the printing section in your application documentation.

For information on print media types and sizes, see chapter 5, "Print Media and Daily Operations." For information about using your printer's color-printing features, see chapter 7 of this manual, "Optimizing Color Output."

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Connecting to a PC

If you have a brand-new computer, before connecting the printer, you should follow the manufacturer's instructions for setting up the computer, including (if it's not already installed) any operating system software, such as DOS and Windows.

What You Need

To connect your printer to a single PC, you need **one** of the following interface cables (not included with your printer, but available at any computer store):

- a parallel cable (with 36-pin and 25-pin male connectors)
- **or** a serial cable (with a 25-pin male and a 9- or 25-pin female connector, depending on the computer's serial port)

If you're replacing a printer, you probably already have the necessary cables.

How to Choose a Cable

We recommend using a parallel cable if possible, because parallel communication doesn't require printer configuration, while serial communication often does. However, if the printer is more than 6 feet (1.8 meters) from the computer, we recommend using a serial cable for better communication.

NOTE: Interface cables should be no longer than 6 feet (1.8 meters) for parallel or 25 feet (7.6 meters) for serial communication.

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Making the Connection

CAUTION: If you're connecting the printer to a single computer, turn off both systems first.

1. At back of the printer, attach one end of the cable to the appropriate port.

   Parallel users: Connect the 36-pin end of the cable to the printer port labeled "parallel," and close the clips.

Fig. 3.2 *Parallel Ports*

   Serial users: Connect the male end of the cable to the printer port labeled "serial," and tighten the screws.

Fig. 3.3 *Serial Ports*

NOTE: The port covered with a metal bracket is the SCSI port, which is used for connecting external hard disks.

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2. At the computer, attach the other end of the cable to appropriate port. (The parallel port is female, and the serial port is male.)
3. Turn on the printer and the computer.
4. Test communication.

   Parallel users: You can do this by sending a file from one of your applications or you can see "Testing Parallel Communication," later in this chapter.

   Serial users: You can do this by sending a file from one of your applications or you can see "Testing Serial Communication," later in this chapter.
5. See "PC Printing Software," below to finish connecting the printer.

PC Printing Software

If you're replacing a color PostScript printer, you can probably start printing now with the printing software already in place. You can refer to your application documentation for instructions on sending documents to the printer.

However, if you want to be able to use all your printer's special features (like QCOLOR automatic color control technology, media size and type selection, and collation), **or** if you've never printed to a color PostScript printer before, we recommend you take a few minutes to make sure you have the following printing software installed:

- PS Executive Series Utilities
- A color PostScript printer driver

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- Printer description files (if you use QuarkXPress 3.3, Aldus PageMaker, or Adobe PhotoShop)

PS Executive Series Printer Utility Software

PS Exec, included on the DOS disks we shipped with your printer, is a utility for controlling the printer from the computer. For example, through PS Exec you can turn off the start-up page, rename the printer, download fonts, manage hard disks, print font samples, or print a file containing four-color simulations of Pantone-identified colors and the percentage of the process colors used to create them. Many of the procedures described in this manual involve using PS Exec. The README file on the PS Executive disk explains how to install the program, and the on-line help explains how to use it.

Installing a Color PostScript Printer Driver

If you're using Windows, we recommend that you install the QMS-developed Windows driver. See "Installing the Windows 3.1 Driver," below.

If you're using a non-Windows application, read the printing section of the application documentation for information on choosing a color PostScript driver. If the application does not provide a color PostScript driver, contact the application manufacturer to see if one has become available since you bought the program. Also, color PostScript drivers for some applications are available through the QMS Corporate Bulletin Board System and through CompuServe; see appendix A, "QMS Customer Support," for information.

Also, check to see if application notes (tips for printing from specific applications) are available for your application from

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Q-FAX, the QMS bulletin board, or CompuServe. Appendix A, "QMS Customer Support," explains how to use these QMS information services.

Installing the Windows 3.1 Driver

NOTE: The QMS-developed Windows driver supports all the printer's advanced capabilities. However, if you experience printing problems while using our driver with a particular application, or if your application (like Aldus PageMaker) requires the use of the Microsoft PostScript driver, then we recommend using the Microsoft driver along with the QMS WPD file, to add printer-specific capabilities to the driver. (In this case, the QMS driver for Windows can remain loaded in order to be used for other applications.) The QMS WPD file is on the Windows Drivers disk, shipped with the printer. See the README file on the disk for information on using the WPD.

Install the QMS driver for Windows (QSCRIPT.DRV) using the following procedure:

1. Turn on your computer, start Windows, and insert the QMS "Windows Driver" disk (shipped with your printer) into the computer's 3.5" floppy drive.

2. In Windows, open File Manager and display the contents of the QMS Windows Driver disk.

   Double-click the File Manager icon (usually located in Program Manager's Main window) and double-click the appropriate disk-drive icon (the drive the Windows disk is in) at the top of the File Manager window.

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3. Drag the QSCRIPT.HLP file from the QMS disk to the WINDOWS\SYSTEM directory.

4. Open the Windows Control Panel and double-click the Printers icon.

   The Control Panel icon is usually located in Program Manager's Main window.

5. In the Printers dialog box, choose the Add button.

6. From the List of Printers that appears, choose Install Unlisted or Updated Printer and choose the Install button.

7. In the text box that appears, type the name of the floppy drive (for example, A:\) the Windows disk is in and choose OK.

8. In the Add Unlisted or Updated Printer dialog box, select "QMS PostScript Printer" and choose OK.

   If you see the following message: "Insert Microsoft Windows 3.1 Disk #5 or a disk with the updated SSERIFF.FON file in...," choose the Cancel button.

9. Choose the Connect button to configure your printer port.

10. In the Connect dialog box, select the appropriate host port in the Ports list and choose OK.

11. Choose the Setup button, and in the Printers section of the dialog box that appears, choose your printer (*magicolor* LX).

12. Choose OK to return to the Printers dialog box.

13. Choose Set As Default Printer to make the QMS printer the default printer.

14. Repeat steps 5 through 12 to install the QMS driver for other ports or choose Close to exit the Printers dialog box.

Now you can set printer options from your application by choosing Print Setup from the application's File menu and then choosing the

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Options button. Choose the Help button in any of the driver dialog boxes for information on driver options.

Printer Description Files (PC)

Printer description files for Windows applications are included on the Windows Drivers disk shipped with your printer:

If you use QuarkXPress 3.3, after you install the QMS driver for Windows, install the *magicolor* LX PDF according to the instructions in your QuarkXPress documentation for installing PDFs. The table below shows which printer halftone setting will be in effect for the Quark LPI setting chosen:

LPI	Halftone
15 to 44	Printer default
45 to 54	53 lpi x 45 degrees
55 to 79	71 lpi x 45 degrees
80 to 89	80 lpi x 45 degrees
90 to 99	Enhanced
100 to 125	106 lpi x 45 degrees
126 and higher	Printer default

If you use PageMaker 5.*x*, use the version 4 PPD on our Windows Drivers disk. Also, Aldus requires that the Microsoft PostScript driver (version 3.56 or later) be used with PageMaker. See your PageMaker documentation for installation instructions. To be able to access *magicolor* LX features from the Microsoft driver, add the QMS WPD file (also on our Windows Drivers disk) to the Microsoft driver. See the README file on our Windows Drivers disk for information on adding our WPD. Note that the QMS driver for Windows can be loaded to be used for applications besides PageMaker.

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If you use Adobe Photoshop, for best output quality use the QMS-supplied Windows driver. Then, so that choices in the QMS driver take effect, go to PhotoShop's Page Setup dialog box, and select Use Printer's Default Screen under the Screens option.

Testing Parallel Communication

1. Go to the DOS C:\ prompt.
2. Create a short PostScript test file called PRINTEST.PS by typing the following commands:

   ```
   copy con printest.ps↵
   showpage↵
   ^D^Z↵
   ```

   To type ^D and ^Z, press and hold down the Ctrl key while you type the letters d and z. These are end-of-file characters. You must type **showpage**, which is a PostScript command telling the printer to eject a page, in lowercase letters. The ↵ symbol means press the Enter key, as it does throughout our documentation.
3. At the DOS C:\ prompt, send PRINTEST.PS to the printer by typing the following command:

   ```
   print printest.ps↵
   ```

   If prompted for the name of the list device, type the name of the parallel port the printer is connected to, for example,

   ```
   lpt1↵
   ```

NOTE: If the computer has more than one parallel port, they're probably labeled. If not, check the computer documentation for the LPT port names.

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If the printer and computer are communicating, a blank page should eject from the printer. You are ready to start printing.

If a blank page does not eject and you typed the file correctly, check your AUTOEXEC.BAT file to see if LPT1 (the parallel port) is being directed to COM1 (the serial port). If the AUTOEXEC.BAT file contains the following line, delete it:

```
MODE LPT1:=COM1:
```

Then type

```
mode lpt1:,,p
```

in the AUTOEXEC.BAT file so that print jobs are sent until the printer accepts them. Reboot and try the communication test again. See chapter 9, "Troubleshooting," and refer to your DOS documentation for more information.

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Testing Serial Communication

1. Go to the DOS C:\ prompt.
2. Create a short PostScript test file called PRINTEST.PS by typing the following commands:

   ```
   copy con printest.ps↵
   showpage↵
   ^D^Z↵
   ```

   To type ^D and ^Z, press and hold down the Ctrl key while you type the letters d and z. These are end-of-file characters. You must type showpage, which is a PostScript command telling the printer to eject a page, in lowercase letters. The ↵ symbol means press the Enter key, as it does throughout our documentation.

3. At the DOS C:\ prompt, send PRINTEST.PS to the printer by typing the following command:

   ```
   print printest.ps↵
   ```

   If prompted for the name of the list device, type the name of the serial port you're using at the computer, for example,

   ```
   com1↵
   ```

NOTE: If the computer has more than one serial port, they're probably labeled. If not, check the computer documentation for the COM port names.

If a blank page ejects from the printer, the printer and the computer are communicating. You are ready to start printing.

If a blank page does not eject and you typed the file correctly, make sure the printer's serial port settings match those of the PC. See "Checking Serial Communication Settings," below.

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Checking Serial Communication Settings

If the serial communication test described above doesn't work, then make sure your printer's serial port settings (baud rate, parity, data bits, and stop bits) match those of the PC.

To find out what the PC's serial settings are, look in your AUTOEXEC.BAT file (in the root directory) for a command line like this:

```
MODE COM1:9600,N,8,1,P
```

In this example, the PC's serial port communication settings are 9600 for baud rate, n (no) parity, 8 data bits, and 1 stop bits. The p stands for infinite retry.

To find out what the printer's serial settings are, check the printer's start-up page, which printed out when you first turned it on. It lists the printer's current serial port settings. To change them to match the PC serial settings, use the printer control panel as described below:

1. Press the printer control panel Online/Offline key to make the Online LED go out.
2. Press the Menu key to enter the top-level menu, then press the Next key until the message window displays

   ```
   OPERATOR CONTROL
   ADMINISTRATION
   ```

3. Press the Select key to enter the Administration menu, then press the Next key until the message window displays

   ```
   ADMINISTRATION
   COMMUNICATIONS
   ```

4. Press the Select key to enter the Communications menu, then press the Next key until the message window displays

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```
COMMUNICATIONS
SERIAL
```

5. Press the Select key to enter the Serial menu, then press the Next key until the message window displays

```
SERIAL
BAUD RATE
```

6. Press the Select key to enter the Baud Rate menu. The message window displays the currently selected baud rate (* represents a default setting):

```
*9600 BAUD
```

7. Press the Next key until the correct baud rate is displayed.

NOTE: Baud rates of 19200 and 38400 require that either RTS or CTS hardware flow control (Hdwe Flow Ctl) be selected. These baud rates do not support XON/XOFF software flow control (Rcv Sw Flow CTL).

8. Press the Select key. The message window momentarily displays

RATE
IS SELECTED

(where *RATE* is the baud rate you selected) and then

```
SERIAL
BAUD RATE
```

9. If you want to change other settings, use the Next key to scroll to the setting you want to change, then repeat the procedure described in steps 6 through 8 for finding and selecting new settings.

When you have finished making changes, press the Online/Offline key. The message window displays

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```
SAVE CHANGES?
NO
```

To save your changes, press the Next key so that the message window displays

```
SAVE CHANGES?
YES
```

Press the Select key to save the changes.

10. Press the Online key. The Online LED lights, and the keyboard message window displays `IDLE`.
11. To verify the changes you just made, print a start-up page by turning the printer off, then back on. Compare the serial port settings listed on the page to those in your AUTOEXEC.BAT file.
12. Try the communication test again. If a blank page ejects from the printer, the printer and the computer are communicating. You are ready to start printing.

If a blank page does not eject and you typed the file correctly, see chapter 9, "Troubleshooting," and refer to your DOS documentation for more information.

About the Printer's Communication Modes

The following sections explain the communication mode choices you have with your printer, including the resident emulations, Simultaneous Interface Operation (SIO), and Emulation Sensing Processor (ESP) technology. All of these features enhance the printer-computer interface.

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Simultaneous Interface Operation (SIO)

Simultaneous Interface Operation (SIO), a standard feature of Crown technology, enables your printer to communicate simultaneously with hosts through the LocalTalk, parallel, serial, and optional network interface ports. In other words, SIO allows you to have more than one host communicating with the printer at one time.

Emulation Sensing Processing (ESP) Modes

You can either allow your printer to operate in its default ESP mode or configure its ports to accept jobs in only a particular emulation (for example, PostScript only, HP PCL 5 only, or HP-GL only.) The default printer communication settings can be changed through the Configuration menu, which you access through the control panel: In the Administration/Communications menu, you can choose a default emulation for the parallel and serial interfaces, and in the Administration/Emulations menu, you can configure the printer defaults for each emulation mode. (The LocalTalk interface uses only PostScript.)

Advanced users can also use PostScript operators to reconfigure printer ports. The *QMS Crown Technical Reference* (an optional manual available from your QMS vendor) contains information about PostScript operators.

If you plan to send jobs in a mixture of emulations, you should configure the parallel and serial ports for ESP mode. This mode is a standard feature of Crown architecture. It works with most popular commercially available applications, using a form of artificial intelligence to analyze incoming file data and select the appropriate printer emulation from those installed on the printer.

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If you configure an interface port for ESP mode, then print jobs are processed without your having to change printer switch settings or send software commands to accommodate different printer emulations.

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Chapter 4

Printer Configuration

Chapter highlights:

- Printer configuration methods
- Control panel components and functions
- Moving through the menu and selecting options
- Description of the printer's configuration menu
- Document Option Commands supported

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Introduction

This chapter briefly discusses the different methods of printer configuration and then explains how to use the control panel to configure the printer.

Printer Configuration Methods

Controlling the Printer through an Application's Printer Driver

The easiest way to control the printer is through your application's printer driver. See chapter 3, "Connecting the Printer," of this manual and your application documentation for information on choosing and installing a printer driver. If you print from Windows or a Macintosh, we recommend you use the QMS-developed Windows or Macintosh driver shipped with your printer, because it supports all your printer's special features.

Controlling the Printer with PS Executive Utilities

The PS Executive Series printer utilities software (shipped with the printer) provides a way to control the printer from a host. The PS Executive Series Utilities README file and the on-line documentation explain how to install and use this software.

Controlling the Printer through Printer Commands

The printer can also be controlled through printer commands: PostScript operators, HP-GL commands, HP PCL 5C commands, or QMS Document Option Commands (DOCs). DOCs enable job-specific printer features or features your application or page description language can't access. See *QMS Crown Document Option Commands* and *HP PCL 5 Emulation Technical Reference*

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and the *QMS Crown Technical Reference* (optional manuals available from your QMS vendor) for information on these commands.

Controlling the Printer with the Control Panel

Another way to control the printer is through the Configuration menu, which you access through the printer's control panel. The printer is configured at the factory for the most typical printing environments, so most users don't have to enter the Configuration menu often. However, there are a few situations that may require you to use the control panel:

- To configure the printer for printing on a different media type (for example, transparency instead of paper).
- To configure features not configurable through your application.

NOTE: For information on restoring the factory default settings in the Configuration menu, see the "Administration/Miscellaneous/Restore Defaults" section later in this chapter.

Configuration Method Priorities

Options or values selected through an application or driver receive highest priority and override all other options or values. Those selected through PS Executive Series Utilities have second priority. Those selected through DOCs (Document Option Commands) have third priority, and those selected through the control panel have the lowest priority.

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The Printer's Control Panel

Figure 4.1 shows the printer's control panel.

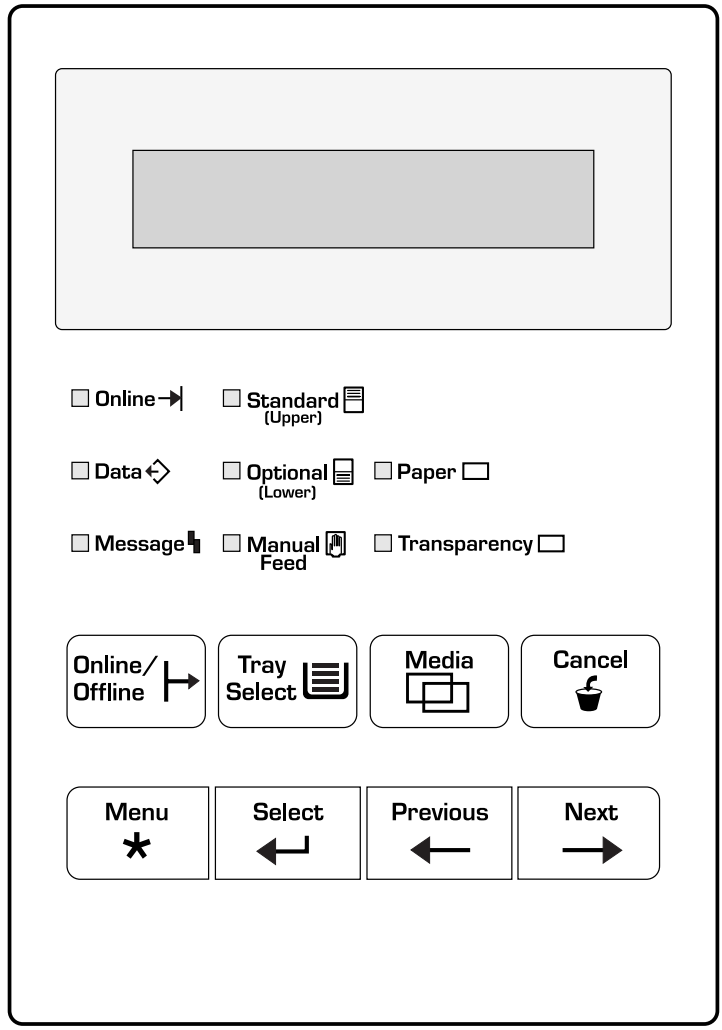

Fig. 4.1 *Printer Control Panel*

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The LCD Message Window

This message window presents status messages and Configuration menu options. When you're in the Configuration menu, the top line of the message window displays the name of the current menu, and the bottom line displays the name of an option within that menu.

Status messages display in order of priority if the printer is on line; they don't display if the printer is off line. Chapter 9, "Troubleshooting," lists and explains status messages.

Use the Clear Warning option to clear a status message that doesn't automatically clear after the related corrective action is taken. See "Administration/Engine/Clear Warning," later in this chapter, for details.

The Control Panel LEDs

The LEDs (Light Emitting Diodes) on the control panel give information about printer status:

☐ Online →|	Illuminated when the printer is on line, ready to accept and process new print jobs.
☐ Data ⇔	Flashes when the printer is receiving data from one or more of the simultaneous interfaces.
☐ Message	Illuminated when the printer requires operator intervention.
☐ Standard (Upper)	Illuminated when the standard paper cassette is selected.
☐ Optional (Lower)	Illuminated when the optional lower cassette is selected.

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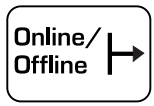
Manual Feed	Illuminated when manual feed is selected using the Tray Select key.
Paper	Illuminated when the media in the active cassette has been defined to be paper.
Transparency	Illuminated when the media in the active cassette has been defined to be transparency.

All the LEDs, except Data and Message, are associated with function keys on the panel.

The Function Keys

The printer control panel has eight function keys. The top row of keys (Online/Offline, Tray Select, Media, Cancel) is for frequently used operations. The bottom row of keys is used to navigate menus, select options, and enter values.

NOTE: When you're in configuration mode (that is, if you have entered the menu by pressing the Menu key), the printer ignores the Tray Select, Media, and Cancel keys.



Pressing the Online/Offline key once takes the printer off line, making the printer ready for configuration.

When the printer goes off line, communication ports close and accept no new data. Although jobs continue to compile and print using data already received, a job may be interrupted when the printer goes off line, causing it to wait for the rest of the data before finishing printing. When the printer is off line, pressing this key

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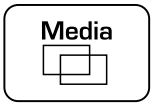
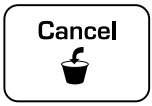
once brings it back on line. When the printer is on line (ready to accept and process new print jobs), the Online LED on the control panel is illuminated.

The Tray Select key allows you to select the cassette from which to draw print media: the standard (upper) cassette, the optional (lower) cassette, or the manual feed tray. The appropriate LED is illuminated to confirm your choice.

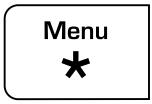


The Media key is used to tell the printer whether paper or transparencies are in the currently selected cassette. The factory default for both upper and lower cassettes is paper.

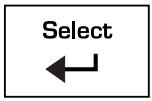


The Cancel key allows you to cancel the "oldest" job(s) compiling or printing in the printer, or to send an end-of-job indicator for a print job. This key can be used without taking the printer off line. See "Cancelling and Ending Print Jobs" in chapter 5, "Print Media and Daily Operations," for more details.

NOTE: If you accidentally press the Cancel key, press the Menu key to tell the printer to stop cancelling a job.



Press the Menu key after the printer goes off line to enter the Configuration menu. In addition, pressing the Menu key returns you to the next higher menu level, allowing you to back out of the Configuration menu one level at a time; tells the printer to stop cancelling a job when you accidentally press the Cancel key; and takes you back one character space at a time in an alphanumeric value.



Press the Select key to enter a menu or to select a menu option or an individual character in an alphanumeric value.

Press the Previous key to scroll backwards through the options in a menu or to decrease an individual character

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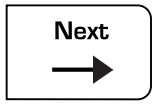
in an alphanumeric value.



Press the Next key to scroll forward through the options in a menu or to scroll through characters available for alphanumeric values.

NOTE: Always make sure the printer is idle and off line before making configuration changes. If the printer is not idle, jobs may be lost.

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Using the Configuration Menu

This section covers how to password-protect menus, how to select options, and how to enter and save values.

Password-protected Menus

The Operator Control and Administration menus may be password-protected if an optional security card is used with the printer. If the message window displays `ENTER PASSWORD` when you use the Select key to enter a menu, a password is required; see your system administrator. For information on entering passwords, see "Entering Alphanumeric Values" later in this chapter. If an invalid password is entered, the message window flashes `INVALID PASSWORD` for three seconds, then returns you to the `CONFIGURATION` menu. If you specify the correct password, you're allowed to enter the menu.

Selecting Options

Most menus offer an array of choices within each menu group. For example, within the Administration menu group, there is a Communications menu; within the Communications menu there is a Parallel menu; within the Parallel menu, there is an Emulations menu, and within the Emulations menu, there are several choices, such as ESP, PostScript, HP-GL, Lineprinter, and PCL 5C (LN03+ and CCITT are listed if installed).

Table 4.1 shows how to select a menu option, using as an example configuring the parallel interface for PostScript mode.

NOTE: The printer must be off line and idle for you to change printer configuration. If the printer is not idle, jobs may be lost.

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Press	What Happens	Message Window
ONLINE/ OFFLINE	You take the printer off line.	OFFLINE
MENU	You enter the Configuration menu.	CONFIGURATION OPERATOR CONTROL
NEXT	You scroll to the Administration menu.	CONFIGURATION ADMINISTRATION
SELECT	You enter the Administration menu, and the first submenu, Communications, displays.	ADMINISTRATION COMMUNICATIONS
SELECT	You enter the Communications menu, and the first submenu, Timeouts, displays.	COMMUNICATIONS TIMEOUTS
NEXT	You scroll to the Serial menu.	COMMUNICATIONS SERIAL
NEXT	You scroll to the Parallel menu.	COMMUNICATIONS PARALLEL
SELECT	You enter the Parallel menu, and the first submenu, Mode, displays.	PARALLEL MODE
NEXT	You scroll to the Emulation menu.	PARALLEL EMULATION
SELECT	You enter the Emulation menu, and the first option, ESP, displays.	EMULATION *ESP
NEXT	You scroll to the PostScript option.	EMULATION POSTSCRIPT
SELECT	You select the PostScript option	POSTSCRIPT IS SELECTED
	After three seconds, you are returned to your previous position in the Parallel menu.	PARALLEL EMULATION
ONLINE/ OFFLINE	You return to the top-level menu.	SAVE CHANGES? NO
NEXT	You scroll to the Yes option.	SAVE CHANGES? YES
SELECT	You save your changes.	IDLE
ONLINE/ OFFLINE	You put the printer on lline.	

Table 4.1 *Selecting a Configuration Option*

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Entering Alphanumeric Values

In some submenus, you choose options by entering an alphanumeric string instead of by selecting from a list. Entering alphanumeric values through the control panel is similar to setting the time and date on a digital watch. You enter the information one character at a time. To change alphanumeric values in the Configuration menu

- Use the Next key to scroll forward through the list of available characters.
- Use the Previous key to scroll backwards through the list of available characters.
- Use the Select key to move the cursor to the next character or (when it's flashing on the last character) to select the new value.
- Use the Menu key to move the cursor to the previous character or, when the cursor's flashing on the first character, to select the new value.

When you select a new alphanumeric value, the printer checks to see if it is valid. If it is invalid, the alphanumeric value reappears for editing. Press the Menu key to cancel any changes to the value.

A space (no character) is available as a selection. You can set an alphanumeric value to null by entering spaces instead of characters.

Table 4.2 shows how to change an alphanumeric value, using as an example the scaling percent option in HP-GL emulation. The table starts in the Administration/Emulations/HP-GL menu.

NOTE: Boxed type in the table below means that the value is flashing in the message window.

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Press	What Happens	Message Window
SELECT	You enter the HP-GL submenu.	HP-GL SCALING PERCENT
SELECT	First character flashes to show it is ready to be changed.	SCALING PERCENT [1]00
NEXT	You scroll to the next value for the flashing character.	SCALING PERCENT [2]00
NEXT	You scroll to the next value for the flashing character.	SCALING PERCENT [3]00
NEXT	You scroll to the next value for the flashing character.	SCALING PERCENT [4]00
NEXT	You scroll to the next value for the flashing character.	SCALING PERCENT [5]00
SELECT	The second character flashes.	SCALING PERCENT 5[0]0
SELECT	The last character flashes to show it is ready to be changed.	SCALING PERCENT 50[0]
PREVIOUS	You scroll to the previous value for the flashing character, a space character. This changes the value from 500 to 50.	SCALING PERCENT 50
SELECT	You choose 50 as the new setting for Scaling Percent.	50 IS SELECTED
	After three seconds, you are returned to your previous position in the HP-GL submenu.	HP-GL SCALING PERCENT
ONLINE/ OFFLINE	You return to the top-level menu.	SAVE CHANGES? NO
NEXT	You scroll to the Yes option.	SAVE CHANGES? YES
SELECT	You save your changes.	IDLE
ONLINE/ OFFLINE	You put the printer on line.	

Table 4.2 *Entering Alphanumeric Values*

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Saving Configuration Selections

Press the Online/Offline key to exit the Configuration menu or press the Menu key to back out of the Configuration menu one level at a time. If you made changes before exiting the menu, the message window displays

```
SAVE CHANGES?
NO
```

If you don't want the changes you made to take effect, press Select, and then press the Online/Offline key to put the printer back on line.

If you want the changes you made to take effect, press the Next key to change `NO` to `YES` and then press the Select key. The changes are saved and take effect when you put the printer back on line. If the Message Window displays `WAITING FOR IDLE`, the system is finishing jobs in progress under the old configuration values, but is not allowing any new jobs to begin. The printer then accepts new jobs and processes them using the new configuration values.

NOTE: Some menu changes require that the printer be rebooted before they take effect, including the following:

Operator Control/Media
Administration/Communications/Serial/Mode
Administration/Communications/Parallel/Mode
Administration/Emulations/ESP Default
Administration/Startup Options/Error Handler
Administration/Disk Operations/Spool Overflow
Administration/Disk Operations/Collation

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If you make configuration changes to other menu options and they don’t seem to be taking effect, wait until the current jobs end, and then try turning the printer off and on again.

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The Main Menu Groups

The main menu groups in the Configuration menu are Operator Control and Administration (with the Installation menu also appearing if a security cartridge is installed) (fig. 4.2). Related functions are grouped together within submenus. The scrolling order of menu options on a given level varies.

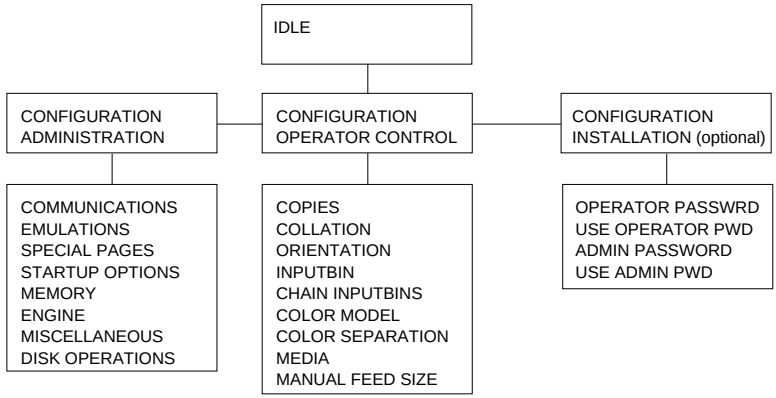

Fig. 4.2 *Configuration Menu*

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The Installation Menu

The Installation menu (fig. 4.3) appears only when a security card is in use. This menu is used to password-protect the Operator Control and Administration menus.

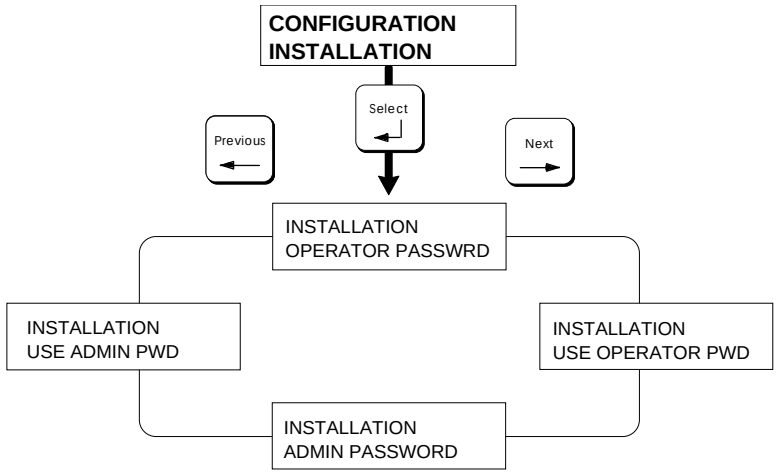

Fig. 4.3 *Installation Menu*

Installation/Operator Passwrd

The Operator Passwrd menu allows you to choose the password (up to 16 characters in length) used to enter the Operator Control menu when Use Operator Pwd is set to on.

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Installation/Use Operator Pwd

The Use Operator Pwd menu determines if a password is required to enter the Operator Control menu. The choices are on or off; the factory default is off.

Installation/Admin Password

The Admin Password menu allows you to choose the password (up to 16 characters) used to enter the Administration menu when Use Admin Pwd is set to on.

Installation/Use Admin Pwd

The Use Admin Pwd menu determines if a password is required to enter the Administration menu. The choices are on or off; the factory default is off.

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The Operator Control Menu

It's usually better to choose the selections available in Operator Control within your application, if possible. This is especially true in a network environment, where other users' jobs are likely to have different requirements than yours. However, this menu is provided in case your application or driver doesn't support all these selections.

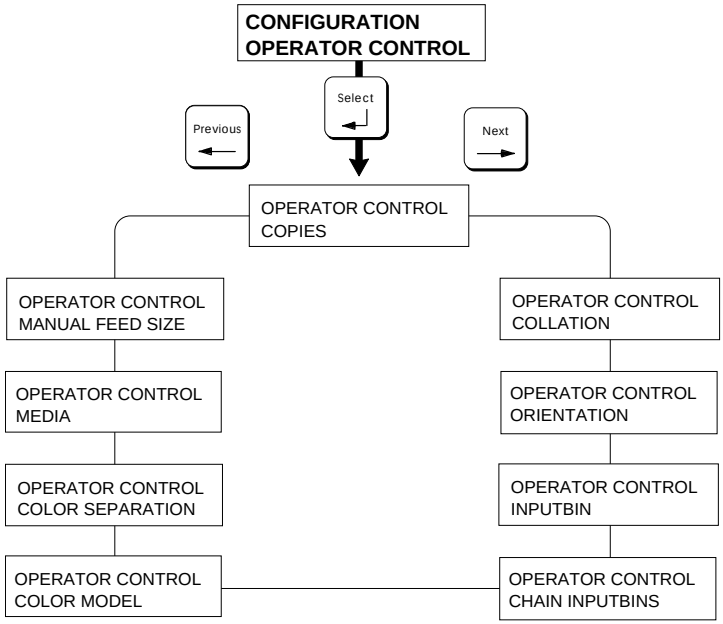

Fig. 4.4 *Operator Control Menu*

Operator Control/Media

NOTES: The printer must be turned off and on again before changes to this menu take effect. The Media key on the printer's control panel provides a faster means of

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changing this setting, but does not contain a thick stock option.

Use this option to tell the printer what type of media is in each tray so the printer can optimize output for that media type. To use the Media menu, first select a media tray (upper for the standard cassette slot, lower for the optional sheet feeder, or manual for the manual-feed tray). Then select paper, transparency, or thick stock for that tray. Select Paper for printing paper, envelopes, or labels. Select transparency for printing on overhead transparency film. Select thick stock (for the manual-feed tray only) for printing on stock that is between 24 and 43 lb (90 g/m^2 and 163 g/m^2). The factory default is paper.

Operator Control/Copies

Use this option to specify the number of copies of each job sent to the printer, from 001 to 999. The factory default is 001.

Operator Control/Collation

Use this option to turn collation off or on. The factory default is on. See “Collating” in chapter 5 for more details.

Operator Control/Orientation

Use this option to determine the orientation of the image on a page, either portrait (vertical) or landscape (horizontal). The factory default is portrait.

Operator Control/Inputbin

Use this option to select the input bin (the standard upper cassette or the optional lower cassette) from which to draw media. The

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factory default is upper. The current selection is indicated by the corresponding LED.

NOTE: A status message on the control panel will let you know immediately if the selected cassette isn't installed. If the selected cassette is out of paper, a paper out status message appears when you send the job to be printed.

Operator Control/Chain Inputbins

Use this option to turn on or off cassette switching (chaining) when the first cassette empties to another cassette with the same size and type of media. The factory default is off.

Operator Control/Color Separation

Use this option to turn color separation on or off. The factory default is off.

Operator Control/Color Model

Use this option to select between full-color or monochrome printing. The factory default is full color. Monochrome must be selected as the default if you want to print 600 dpi jobs on a printer with less than 24 MB RAM. You also may want to select monochrome when printing on legal-size media, because the printer's imageable region for full color is limited to 8.1" x 11.7" (205.90 mm x 297.18 mm).

Operator Control/Manual Feed Size

Whenever you switch media sizes in the manual feed tray, you must tell the printer what the new size is. The choices are letter, legal, executive, A4, DL envelope, and Com 10 envelope. The factory

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default is letter (or A4). See chapter 5, “Print Media and Daily Operations,” for more information on media sizes.

NOTE: If the selected paper size doesn’t match the job size requested, images may be positioned incorrectly on the page, or may print off the edge of the page. If this happens, the resulting loose toner may adhere to the back of subsequent pages.

The Administration Menu

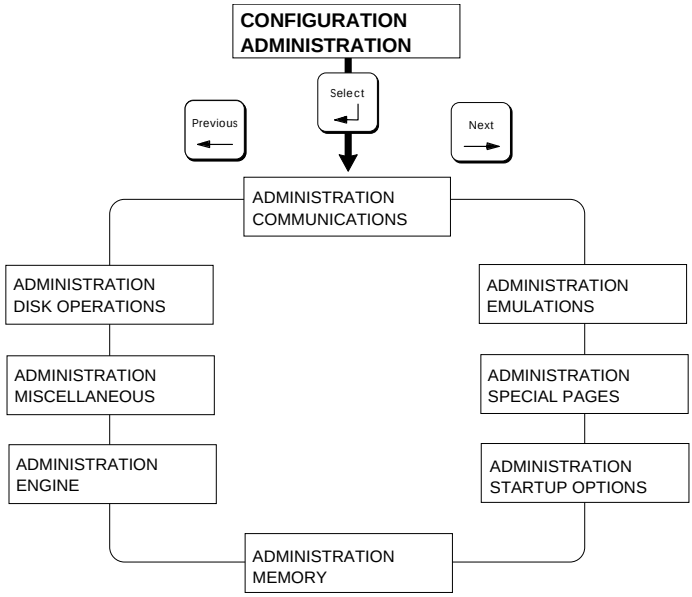

Fig. 4.5 *Administration Menu*

NOTE: The items designated as factory default indicate those present when QMS ships the printer. The default of the system is the value or option last chosen. The options

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within these menus are seldom changed after the initial system installation.

Administration/Communications

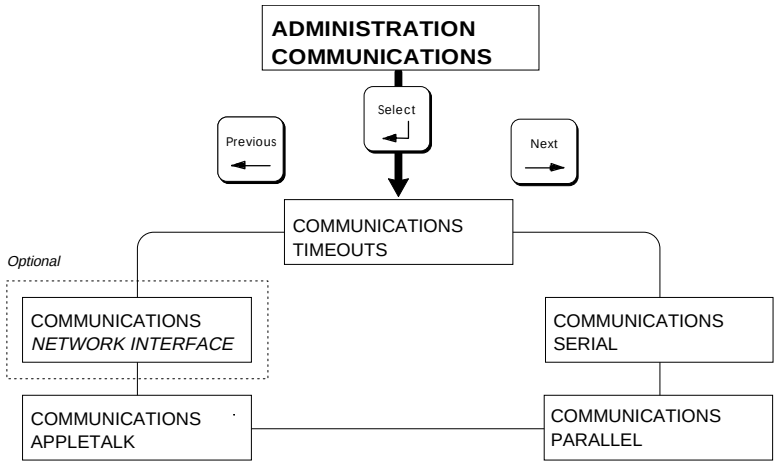

Fig. 4.6 *Communications Submenu*

NOTE: If you have an optional interface installed, see the documentation that came with it for a description of options under the Administration/Communications menu.

Administration/Communications/Timeouts

The Timeouts option sets a limit to the amount of time the printer waits on transmission from the host for various types of data. Setting a timeout to 00000 is the same as specifying no timeout.

PS Wait Timeout The number of seconds that PostScript emulation mode waits for incoming data, from 00000 (no timeout) to

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99999, with a factory default of 00030. If the printer goes idle after 30 seconds and does not print, this timeout should be increased. Large jobs, such as graphics applications or computer-aided design, require this number to be increased to 00300. **Note:** When a print job is sent from a Macintosh, the PS Wait timeout is automatically changed to 300.

Emul Timeout The number of seconds that emulations other than PostScript (such as HP-GL or an optional emulation) wait for additional incoming data, from 00000 (no timeout) to 99999, with a factory default of 00005.

Job Timeout The number of seconds the printer spends processing a job before it ends the job, from 00000 (no timeout) to 99999, with a factory default of 00000 (no timeout).

ESP Timeout The number of seconds the printer (when set for ESP mode) spends trying to match emulations before printing the job using the default emulation (Administration/Emulations/ESP Default menu), from 00000 (no timeout) to 99999, with a factory default of 00003.

Administration/Communications/Serial

This option allows you to configure the printer-host communications when using the serial interface.

Mode Mode allows or disallows the PostScript emulation interactive mode from the host. The options are interactive, noninteractive, and disabled. If mode is set to disabled, the printer accepts no jobs through this protocol. Interactive mode allows two-way communication between the host and the printer. Non-interactive is unidirectional communication from the host computer to the printer only. The factory default is interactive. The printer must be rebooted for a change in this setting to take effect.

Emulation This option selects the emulation for the printer serial port. The emulations available are ESP, PostScript, HP PCL 5C, HP-GL, Lineprinter, and Hexdump. Optional

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emulations, like LN03 Plus and CCITT, appear only if installed. The factory default emulation is ESP.

Min K Spool The minimum amount of RAM (KB) dedicated to the serial interface. Do not set this value greater than K Mem for Spool. The default is 00015.

Spool Timeout The number of seconds the interface waits for data from the host system before terminating a print job. The minimum value is 00000 (no timeout), the maximum value is 99999, and the factory default value is 00030.

End Job Mode This option enables or disables data stream sensing for end-of-document (EOD) terminator strings. These sequences allow host computers to enforce print job sequencing without considerations for interacting timeouts. The values are none (printer recognizes only the PostScript ^D command), QMS EOD (%%EndOfDocument), and HP EOD (<ESC>%-12345X). The factory default is none. See "Cancelling and Ending Print Jobs" in chapter 5 for more details.

Baud Rate The baud rate is a measure of the rate of transmission (bits per second) from host to printer over the serial channel. The baud rate options are 300, 600, 1200, 2400, 4800, 9600, 19200, and 38400. The factory default is 9600. Host and printer baud rates must match.

Baud rates of 19200 and 38400 require either RTS or CTS hardware flow control (Hdwe Flow Ctl). These baud rates do not support XON/XOFF software flow control (Rcv Sw Flow CTL).

Parity Parity acts as a check bit to identify data transmission errors. The options are none, mark, space, odd, or even. The host or application parity setting must match the printer's parity setting. The factory default is none.

Ignore Parity Ignore parity options are off or on; the factory default is off.

Rcv Sw Flow Ctl The software communication protocol used by the printer to control communication from the host. The options are XON/XOFF, robust XON/XOFF,

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ETX/ACK, and none. The factory default is XON/XOFF.

Xmit Sw Flow Ctl — The software communication protocol used by the host to control communication with the printer. The options are none, XON/XOFF, ETX/ACK. The factory default is none.

Data Bits — The number of data bits (either 7 bits or 8 bits) transmitted per character. The factory default is 8 data bits.

Stop Bits — The number of stop bits (either 1 bit or 2 bits) transmitted per character. The factory default is 1 bit.

Hdwe Flow Ctl — All the hardware flow control settings must be the same as those of the host. The options are DSR POL (Data Set Ready Polarity: high or low; factory default low), DSR (Data Set Ready: on or off; factory default off), DTR POL (Data Terminal Ready Polarity: high or low; factory default low), DTR (Data Terminal Ready: on or off; factory default on), RTS (Request to Send: on or off; factory default off), and CTS (Clear to Send: on or off; the factory default is off).

PS Protocol — This option sets the binary communications protocol (BCP) for communicating over a serial, parallel, or optional network interface to a PostScript printer. BCP allows any 8-bit binary value (0-255) to be treated as data while allowing a few of the values to function as special control characters.

Four choices are available through the PS Protocol submenu for the serial interface. The default is normal.

Normal: Enables standard, ASCII hex protocol. Data is sent and received in ASCII format. Print jobs can alter this value through PostScript operators.

Normal Fixed: Enables standard, ASCII hex protocol. Print jobs cannot alter this value through PostScript operators.

BinaryEnables binary communications protocol (BCP). Print jobs can alter this value through PostScript operators.

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Binary Fixed: Enables binary communications protocol (BCP). Print jobs cannot alter this value through PostScript operators.

When PS Protocol is set to the normal fixed or binary fixed mode and a print job sends PostScript operators to change the input device mode, the operators are accepted but not acted upon. See appendix D, "Additional Technical Information," for more information on PS Protocol.

Administration/Communications/Parallel

This option allows you to configure the printer to match the host communications when using the parallel interface.

Mode Mode allows or disallows the PostScript emulation interactive mode from the host. The options are interactive, noninteractive, and disabled. If disabled, the printer accepts no jobs through this protocol. Interactive mode allows two-way communication between the host and the printer. Noninteractive is unidirectional communication from the host to the printer only. The factory default is noninteractive. The printer must be rebooted for a change in this setting to take effect.

Emulation This option selects the emulation for the printer parallel port. The choices available for Emulations are ESP, PostScript, HP PCL 5C, HP-GL, Lineprinter, and Hexdump. Optional emulations, like LN03 Plus and CCITT, appear only if installed. The factory default emulation is ESP.

Min K Spool The minimum of RAM (KB) dedicated to the parallel interface. Do not set this value greater than K Mem for Spool. The default setting is 00015.

Spool Timeout The number of seconds the parallel interface waits for data from the host system before terminating a print job, from 00000 (no timeout) to 99999, with a factory default of 00030.

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Data Bits The number of data bits (either 7 bits or 8 bits) transmitted per character. The factory default is 8 data bits.

End Job Mode This option enables or disables data stream sensing for end-of-document (EOD) terminator strings. These sequences allow host computers to enforce print job sequencing without considerations for interacting timeouts. The values are none (printer recognizes only the PostScript ^D command), QMS EOD (%%EndOfDocument), and HP EOD (<ESC>%-12345X). The factory default is none. See "Cancelling and Ending Print Jobs" in chapter 5 for more details.

PS Protocol This option sets the binary communications protocol (BCP) for communicating over a serial, parallel, or optional network interface to a PostScript printer. Choices for the parallel interface are normal, normal fixed, binary, and binary fixed. The default is normal. Descriptions of these options are in "Administration/Communications/Serial," earlier in this section.

Administration/Communications/AppleTalk

This option allows you to configure printer-host computer communications when using the AppleTalk interface.

Mode Mode enables or disables the PostScript emulation interactive mode from the host. The default is enabled. If disabled, the printer accepts no jobs through this protocol.

Connection Connection allows you to enable or disable print spooling. The options are Conventional and Spool. Conventional, the factory default option, allows one AppleTalk connection and accepts only one print job at a time. If two users send print jobs to the printer, the workstation belonging to the first user is tied up until the first job has been printed, and the workstation belonging to the second user is tied up until both jobs have been printed. The Spool option allows multiple AppleTalk connections and accepts (spools) more than

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one print job at a time. Workstations are not tied up while jobs are printing.

Min K Spool The minimum amount of RAM (KB) dedicated to the LocalTalk interface. Do not set this value greater than K Mem for Spool. The default is 00015.

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Administration/Communications/Network Interface
This option allows you to configure printer-host communications when using an optional interface card. Appendix D of this manual, "Additional Technical Information," contains information about the PS Protocol option. See the documentation that came with the interface card for details on other options.

Administration/Emulations

NOTE: The Emulations menu allows you to *customize* emulation settings. To *choose* an emulation or ESP for a particular interface, see that interface menu in the Administration/Communications menu.

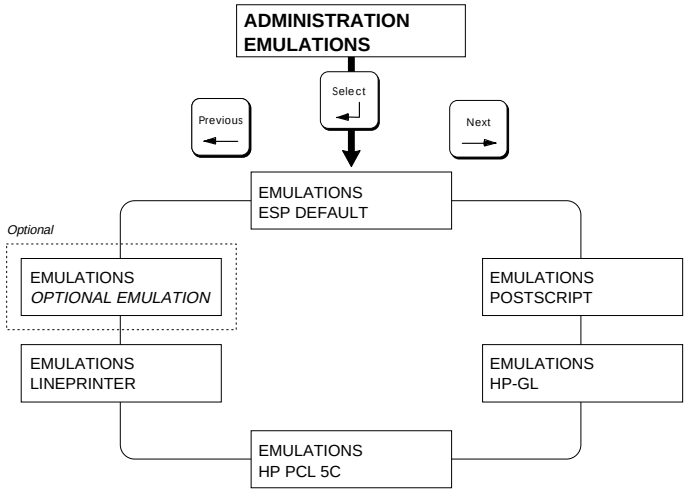

Fig. 4.7 *Emulations Submenu*

Administration/Emulations/PostScript
Within the Emulations/PostScript menu are a PostScript Emulation Level option, a Default Halftone option, a Default CRD (Color

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Rendering Dictionary) option, a Default Dithering option, and a Gamma Correction option.

Default Halftone

This option allows you to choose a printer default halftone from the following settings: 106 (screen lines per inch) x 45° (screen angles), 71 lpi x 45°, 80 lpi x 45°, 53 lpi x 45°, and the factory default Enhanced setting. The Enhanced setting gives the best results for most jobs, especially jobs containing a mixture of text, graphics, or sampled images. See chapter 7, "Optimizing Color Output," for information about the halftone settings and their uses.

NOTE: If you choose halftones settings (such as line frequencies or spot functions) in your application, those settings probably take precedence over the halftones in the Default Halftone menu.

Emulation Level

This option allows you to choose either PostScript Level 1 emulation or PostScript Level 2 emulation as your printer's default PostScript emulation. This option is useful if you have files prepared in an application that is not fully compatible with Adobe's PostScript Level 2 page description language. However, Level 2 works for Level 2 files and most Level 1 files. The default is PostScript Level 2 emulation.

Default CRD (Color Rendering Dictionary)

For color matching with PostScript Level 2 applications, this option allows you to choose from the following color rendering dictionaries: Colorimetric 600, Colorimetric 300, Business 600 (the factory default), Business 300, Photographic 600, and Photographic 600. Since the printer has a different range of colors than other color devices (such as your monitor), a color rendering dictionary is necessary to tell the printer how to print colors that are out of its range. See "Printer-Resident Color Rendering Dictionaries" in chapter 7, "Optimizing Color Output," for more information on choosing a CRD. Additional CRDs may be available from your QMS vendor.

Default Dithering

This option allows you to specify the default dither pattern used by the printer. The choices are standard,

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enhanced low, enhanced medium, and enhanced high. Standard, the factory default setting, is PostScript-compatible dithering. Enhanced dithering reduces the banding sometimes seen in PostScript-compatible dithering, with enhanced high producing the least banding. The factory-default Standard setting should not be changed if you are using the factory-default Enhanced halftone setting.

Gamma Correction This option allows you to choose the amount of gamma correction for the printer. Choices are

Gamma71 (0)
Gamma53 (1)
Gamma80 (2)
Gamma106 (3)
None (4)

The default is None. The factory-default None setting should not be changed if you are using the factory-default Enhanced halftone setting. Otherwise, the gamma setting should correspond to the printer default halftone chosen. (For example, when the 53 lpi x 45° halftone is selected, the Gamma53 gamma setting should be selected.)

Administration/Emulations/Lineprinter

Twelve configuration choices are available:

Font In this submenu, you can enter the name of a font (any PostScript font on the printer) to be used for Lineprinter jobs. The factory default is Courier. To see a list of PostScript fonts available, print an advanced status page from the front control panel (from the Administration/Special Pages/Print Status submenu).

Point Sz 100ths Sets the five-digit value used to specify the point size of the font for the current print job. The range is from 00400 (4 points) to 25600 (256 points). The default is 00880 (8.8 points).

Character Maps Specifies the type of character map to be used. The choices are ASCII and EBCDIC. The default is ASCII.

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Line Numbering	Specifies that a five-digit number is to be prefixed to the beginning of each line. The choices are On and Off. Off is the default.
Tab Stops	Specifies the number of spaces between tab stops. The minimum is 0 and the maximum is 256. The default is 8.
LF IS CRLF	Stipulates whether each line feed in the print job is translated to a carriage return/linefeed combination. The choices are On and Off. On is the default.
CR IS CRLF	Determines whether each carriage return in the print job is translated to a carriage return/line feed combination. The choices are On and Off. Off is the default.
FF IS CRFF	Stipulates whether each form feed in the print job is translated to a carriage return/form feed combination. The options are On and Off. On is the default.
Orientation	Specifies whether text is printed Portrait or Landscape. The default is Portrait.
Autowrap	Indicates whether long lines are to be wrapped onto the next line instead of being truncated. The options are On and Off. The default is on.
Lines Per Page	Specifies the number of lines printed on a page before an automatic page eject. Interline spacing is set to the selected point size. Logical pages consisting of more lines than specified are split into multiple pages. The minimum Lines Per Page setting is 1, and the maximum is 128. The default is 87.
Margins	This option defines the left, right, top, and bottom margins from 0 to 17 inches. The minimum setting is 0 and the maximum is 1700. The default is 0.

Administration/Emulations/HP-GL

Fifteen configuration choices are available. The *QMS Crown Technical Reference* (an optional manual available from your QMS vendor) has more information on HP-GL.

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Plotter Choices include 7550A (the factory default), 7475A, 7470A, and ColorPro.

Scaling Percent Choices range from 1 to 150 percent of the original size. The default is 100 percent.

NOTE: To scale plots, select the paper size originally used for the plot in the Paper Type menu; then enter the reduction or enlargement needed to fit the plot on the new page in the Scaling Percent menu. If necessary, enter new x,y coordinates in the Origin menu to reposition the plot on the page.

Origin Choices range from 0 to 850 to the right (x direction) and 0 to 1100 upward (y direction) in .001" increments. In normal orientation, the 0,0 origin point is the lower-left corner (when the page is viewed in landscape orientation) of the imageable area. The default values are 0000 in the x direction and 0000 in the y direction.

Reverse Image This option applies only to monochrome printing. Choices are off (black on a white background) and on (white on a black background). The default is off.

Enhanced Mode This option allows you to choose enhanced resolution for HP-GL output. Choices are off (standard resolution for fixed- and variable-spaced fonts, 4 x 8 grid) and on (enhanced resolution for variable-spaced fonts, 26 x 36 grid). The default is off. Use the enhanced mode for 7550A plotter emulation.

Expand Mode Choices are off and on (default scaling points, hard-clip plotting range, and maximum plotting area are all expanded). The default is off.

Paper Type Choices are A, A3, A4, B, and Scale to Paper (the factory default). Select the media size for which the plot was originally created.

Pens 1-8 Pen width choices range from .1 mm to 6 mm, in 0.1 mm increments (you can also enter a value of 0 for a 1-pixel wide line). Color choices are black, violet, brown, 25% gray, 50% gray, 75% gray, red, orange, yellow, green, blue, cyan, and magenta.

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The default pen width is 07 (0.7 mm) for pen 1 and 03 (0.3 mm) for all other pens. The default color settings are as follows: pen 1-black, pen 2-black, pen 3-red, pen 4-green, pen 5-blue, pen 6-violet, pen 7-orange, and pen 8-brown.

Administration/Emulations/HP PCL 5C

See the *QMS Crown Technical Reference* and the *HP PCL 5 Emulation Technical Reference* (optional manuals available from your QMS vendor) for more information on HP PCL. Also, the *HP PCL 5C Technical Support Notes*, available free through our bulletin board, Q-FAX, and CompuServe, has information on HP PCL 5C.

Default Font — Sets the printer default fonts. Choices are Courier 10 point (12 pitch), Courier 10 Bold, Courier 10 Italic, Courier 12 point (10 pitch), Courier 12 Bold, Courier 12 Italic, Times, Times Bold, Times Italic, Times Bold Italic, Universe, Universe Bold, Universe Italic, Universe Bold Italic, Universe Condensed, Universe Condensed Bold, Universe Condensed Italic, Universe Condensed Bold Italic, Lineprinter (8.5 point, 16.66 pitch), and Select by Index. The Courier and Lineprinter fonts are bitmapped; the others are scalable. The default is Courier 12 point (10 pitch).

Symbol Set — Sets the value for the character set used by PCL 5C jobs. Choices include Roman-8, PC-850, PC8-US, PC8-DN, ECMA-94, Legal, HP German, HP Spanish, ISO 2, ISO 4, ISO 6, ISO 10, ISO 11, ISO 14, ISO 15, ISO 16, ISO 17, ISO 21, ISO 25, ISO 57, ISO 60, ISO 61, ISO 69, ISO 84, ISO 85, Desktop, PS Math, Math 8, Microsoft-Pub, PI-Font, PS-Text, Ventura-Intl, Ventura-Math, Ventura-US, Windows, PS-Zapf-Dingbats, Ventura-Dingbats, Zapf-Dingbats100, Zapf-Dingbats200, Zapf-Dingbats300. The default is Roman-8.

Lines Per Inch — Sets the number of lines printed per inch. The factory default is 6.

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Line Termination Adds an indicator that controls the way the printer interprets CR (carriage return) and LF (line feed) characters. The options are CR=CR, LF=LF; CR=CR+LF, LF=LF; CR=CR, LF=CR+LF; CR or LF=CR+LF. The factory default is CR=CR, LF=LF.

Point Size x100 Identifies the point size in hundredths and is selectable in increments of 25. The minimum value is 25, the maximum is 99975, and the default is 1200.

Retain Temporary Allows you to choose whether or not to retain temporary PCL 5C macros and fonts at the end of each print job. The options are on (save the temporary macros and fonts) and off (temporary fonts and macros are deleted at the end of each job). The default value is off.

Scalable Fonts Specifies whether to enable or disable the printing of PCL 5 scalable fonts. The choices are enable (the factory default) and disable. When you enable this option and print PCL 4 documents, PCL 5 may substitute scalable fonts that could cause your PCL 4 documents to print incorrectly. When this option is disabled, fonts are bitmapped. This option is designed to be used for PCL 4 documents that print incorrectly under PCL 5.

Default Font IDX Sets the default font index when Select by Index is chosen in the Default Font menu. It is a numeric value with a minimum setting of 0, a maximum of 32767, and default of 0.

Monochrome GL/2 Determines whether HP-GL 2 documents are printed in shades of gray (on) or color (off); the default is color (off).

Default: Off

Pen Color Defaults:

Pen 0 = White
Pen 1 = Black
Pen 2 = Red
Pen 3 = Green

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Pen 4 = Yellow
Pen 5 = Blue
Pen 6 = Magenta
Pen 7 = Cyan

Range:

On
Sets the printer to monochrome (2 pen).

Off
Sets the printer to color (8 pens).

When set to on, the printer maps each pen to its assigned color, then converts the color to a grayscale using the National Television System Committee (NTSC) color standard for luminosity coefficients (Additive System): Y = .3R + .59G + .11B

Example of how to use the Color Standard: Formula

White	Y = [(1*0.3) + (1*0.59) + (1*0.11)]100% gray
Black	Y = [(0*0.3) + (0*0.59) + (0*0.11)]0% gray
Red	Y = [(1*0.3) + (0*0.59) + (0*0.11)]30% gray
Green	Y = [(0*0.3) + (1*0.59) + (0*0.11)]59% gray
Yellow	Y = [(1*0.3) + (1*0.59) + (0*0.11)]89% gray
Blue	Y = [(0*0.3) + (0*0.59) + (1*0.11)]11% gray
Magenta	Y = [(1*0.3) + (0*0.59) + (1*0.11)]41% gray
Cyan	Y = [(0*0.3) + (1*0.59) + (1*0.11)]70% gray

Download Location

Controls the default storage location of PCL objects (fonts, macros, and patterns) when not otherwise specified through QMS Document Option Commands (DOCs). Choices are Disk (all downloaded PCL objects are stored in the default disk resource, if present) and Memory (all downloaded PCL objects are stored in temporary storage in RAM). Disk is the default setting. DOCs specifying resources override this option on a per-job basis. If this option is set to Disk and no hard disk is installed, memory is used as the default storage location. If the printer has both a hard disk and a large amount of memory, setting this option to Memory enhances printer performance. See *QMS*

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Document Option Commands for more information on DOC.

Other Optional Emulations

If you have an optional emulation installed, such as LN03 Plus, see the documentation that came with it for a description of the options under the Administration/ Emulations menu. The *QMS Crown Technical Reference* and *QMS Document Option Commands* (optional manuals available from your QMS vendor) also have information on optional emulations.

Administration/Emulations/ESP Default

This setting tells the printer what emulation to default to if the printer's emulation sensing technology is unable to identify the emulation needed for a particular job. Default emulation options include PostScript, PCL 5C, HP-GL, and Lineprinter. Optional emulations, such as LN03 Plus, appear only if installed. The factory default emulation for ESP is PCL 5C. Any change to this option takes effect only after turning the printer off and on again.

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Administration/Special Pages

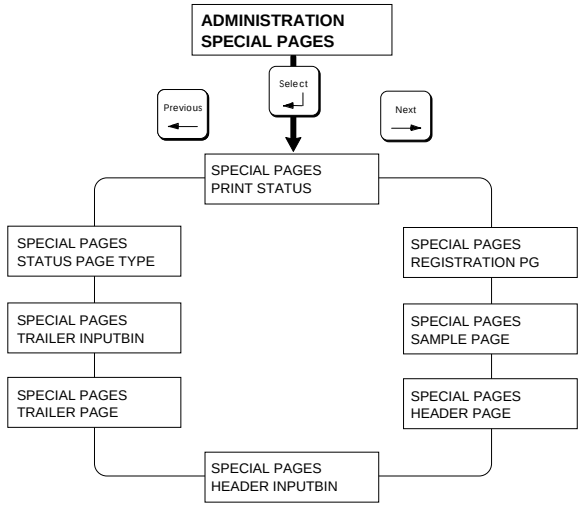

Fig. 4.8 *Special Pages Submenu*

Administration/Special Pages/Print Status

Use this option to print a printer-status page. The standard status page lists printer identification information and settings, current memory configuration, timeout values, communication settings, and input buffer sizes. It also has tickmarks for measuring the printer's alignment. The advanced status page option has the same information as the standard one with the addition of configuration menu settings, fonts, and downloaded emulations. The Administration/Special Pages/Status Page Type menu, discussed later in this section, controls which type, standard or advanced, prints. For more details, see "The Status Pages" in chapter 5."

Administration/Special Pages/Registration Pg

This option controls the printing of a registration page. This page allows you to check color registration (placement of each of the process colors on the page). Color marks going around the outside

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of the page demonstrate horizontal and vertical color registration. Circles in the center of the page demonstrate cyan, magenta, and yellow color mixtures and red, green, and blue color mixtures.

Administration/Special Pages/Sample Page
This option controls the printing of a sample page. This page gives the current screen frequency and halftone angles settings for the printer. A bar that illustrates printing with these settings prints across the bottom of the page.

Administration/Special Pages/Header Page
This option controls the printing of a header banner page before each job. This page contains the following: printer name, selected interface, job identification, title, submitting computer, job owner, routing message, start time/date, application used, creation time/date, copyright date, version number, job submission time, job start time, and printer product name/logo. For details on this page and what it monitors, see "Header and Trailer Pages" in chapter 5. This option is either on or off; the factory default is off.

NOTE: The information on header pages for this printer can be customized; *QMS Crown Document Option Commands* (an optional manual available from your QMS vendor) contains more information on customizing separator pages.

Administration/Special Pages/Header Inputbin
You can select the inputbin (tray or cassette) from which the printer pulls media when printing the header page. Choices are upper and lower. Upper is the factory default.

NOTE: If you used the Administration/Engine/Inputbin *x* Name option to change the names of the input bins, these names replace upper and lower in the message window.

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Administration/Special Pages/Trailer Page
This option controls the printing of a trailer banner/error page for each print job. A trailer page helps you monitor jobs. Think of it as an accounting or tracking system. For details on this page and what it monitors, see "Header and Trailer Pages" in chapter 5. The trailer page also lists any errors generated by the printer while processing or printing your document.

This option can be set to off, on, on error, and errors only with the default being off. Setting this option to on error prints a trailer page (with error messages generated during processing and printing of your job) only if any error occurred. Setting it to errors only prints error messages on the trailer page and omits other trailer page information.

Administration/Special Pages/Trailer Inputbin
You can select the inputbin (tray or cassette) from which the printer pulls media when printing the trailer page. Choices are upper and lower. Upper is the factory default.

NOTE: If you used the Administration/Engine/Inputbin x Name option to change the names of the input bins, these names replace Upper and Lower in the message window.

Administration/Special Pages/Status Page Type
This option controls the type of status page to print. The options are standard (the default) or advanced. See "Administration/Special Pages/Print Status" earlier in this section for a description of the two types of status pages.

Administration/Startup Options

This menu (fig. 4.9) allows you to configure your printer to perform certain actions automatically when it is turned on.

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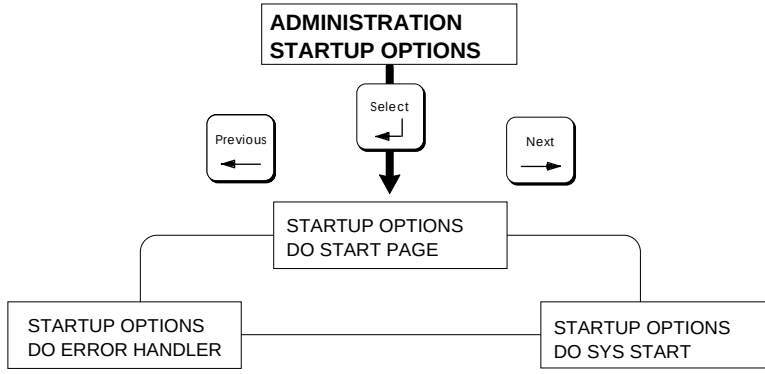

Fig. 4.9 *Startup Options Submenu*

Administration/Startup Options/Do Start Page
This option allows you to enable and disable the start-up page. Choices are yes and no. The factory default is yes.

Administration/Startup Options/Do Sys Start
If you have a hard disk and Do Sys Start is enabled, whenever the printer is turned on, the controller checks the hard disk for a SYS\START file and executes this file. Choices for Do Sys Start are yes and no. The factory default is yes. More information on creating a SYS\START file is available in the *QMS Crown Technical Reference* (an optional manual available from your QMS vendor) and from Q-FAX. See appendix A, "QMS Customer Support," for information on Q-FAX.

Administration/Startup Options/Do Error Handler
When this option is enabled, if a PostScript error occurs during a PostScript print job, a page is generated reporting the error. This information is used by QMS technicians (or users familiar with

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PostScript) for troubleshooting. The *PostScript Language Reference Manual* (Adobe Systems, Reading, MA: Addison-Wesley, 1990. ISBN 0-201-18127-4) contains more information on PostScript errors. Choices for this option are yes and no. The factory default is no.

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Administration/Memory

This section briefly explains what each memory client does. See appendix D, "Additional Technical Information," for detailed information on the printer's memory and what benefits, if any, may result from adding memory to a particular client.

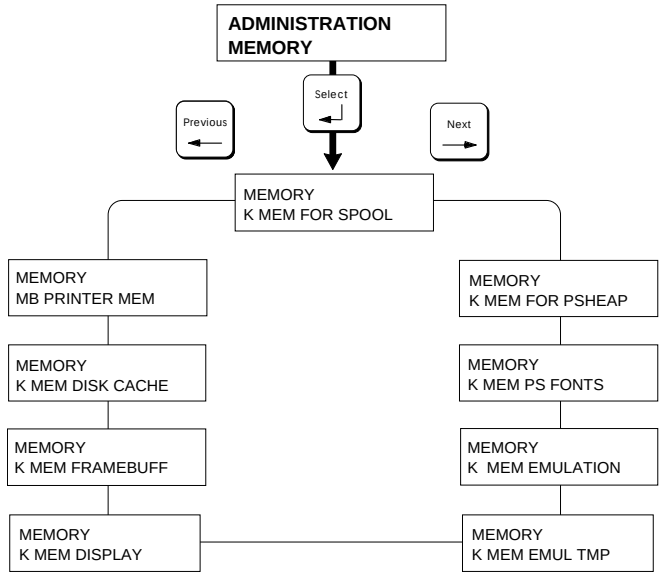

Fig. 4.10 *Memory Submenu*

To find out how memory is currently allocated, print a status page (this option is in the Administration/Special Pages menu) or check each client individually in the Configuration menu. The printer automatically reallocates added or freed memory to either the Display List or the Frame Buffer client, whichever asks for it first. This is the best place for it for most users, but it can be reallocated to other memory clients.

Keep in mind, though, that misallocating memory may hinder printer performance, and that the printer engine's fastest speed is

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3 pages per minute for 2- or 3-color jobs, 2 pages per minute for 4-color, and 8 pages per minute for black and white, no matter how you configure the memory. If you try to set a memory client below a minimum required value or above a maximum allowable value, the message `INCORRECT VALUE` appears in the message window.

Administration/Memory/K Mem for Spool
This is the amount of RAM (KB) dedicated to the spooling buffers. Incoming print job data is stored in this memory client until it is processed and printed. The size range and default varies depending upon the amount of RAM available on your system. (Also, see the "Administration/Disk Operations/Spool Overflow" later in this section.)

Administration/Memory/K Mem for PSHeap
This is the amount of RAM (KB) dedicated to the PostScript emulation interpreter. This memory holds downloaded PostScript emulation fonts, operators, and forms. The size range and default varies depending upon the amount of RAM available on your system. This memory client is also known as virtual memory.

Administration/Memory/K Mem PS Fonts
This is the amount of RAM (KB) dedicated to caching previously scaled bitmap representations of fonts for the PostScript emulation interpreter. This reduces the number of times a PostScript font must be converted from outline form to bitmap form, thus reducing processing time. The size range and default varies depending upon the amount of RAM available on your system.

Administration/Memory/K Mem Emulation
This is the amount of RAM (KB) dedicated to non-PostScript emulations for temporary storage and for loading optional emulations. The size range and default varies depending upon the amount of RAM available on your system. If you are using the

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optional CCITT emulation, this value should be increased by 200 KB.

Administration/Memory/K Mem Emul Tmp
This is the amount of RAM (KB) to be used by non-PostScript emulations for storing downloaded fonts. The size range and default varies depending upon the amount of RAM available on your system.

Administration/Memory/K Mem Display
This is the amount of RAM (KB) dedicated to the display lists. The display list client holds the intermediate representation of pages to be printed in compressed blocks of data. The size range and default varies depending upon the amount of RAM available on your system.

Administration/Memory/K Mem Framebuff
This is the amount of system RAM (KB) dedicated to the frame buffers. This client holds rasterized pages that are ready to be transferred to the print engine. The amount of frame buffer storage affects the maximum size of any single page. The size range and default varies depending upon the amount of RAM available on your system. For example, the factory default setting for a printer with 12 MB of RAM is the amount of memory necessary to print a four-color letter- or A4-size page in 300 dpi resolution. The factory default setting for a printer with 24 MB of RAM is the amount necessary to print a four-color letter- or A4-size page in 600 dpi resolution.

Administration/Memory/K Mem Disk Cache
This is the amount of RAM (KB) dedicated to the disk cache, the area in which frequently used data is stored so it does not have to be continually read from and written to a hard disk (either the standard internal drive or an optional external drive). The size range

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and default varies depending upon the amount of RAM available on your system.

If not enough memory is available for this client, some or all of the optional hard disks may not be accessible and/or an insufficient number of disk cache blocks may be available.

Administration/Memory/MB Printer Mem
This memory client cannot be changed: it is the amount of RAM installed in the printer that is available to be split among the other memory clients.

NOTE: This isn't the same as the amount of physical RAM present in the printer. Because the downloaded system software occupies approximately 3 MB, the amount of physical RAM required will be 3 MB more than the amount of RAM available to configurable memory clients.

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Administration/Engine

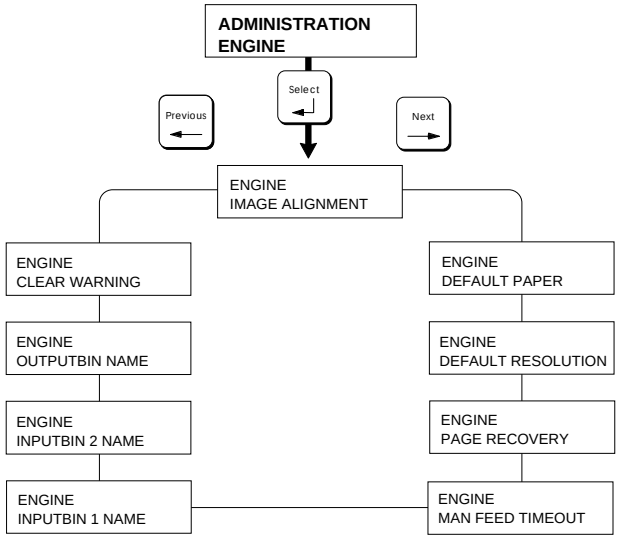

Fig. 4.11 *Engine Submenu*

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Administration/Engine/Image Alignment
The Image Alignment option allows you to adjust the horizontal and vertical placement of printed images. To check image alignment, print a standard status page (this option is located in the Administration/Special Pages menu). When the printer is placing images properly, the alignment tickmarks at the lower left of a status page are 0.5"/12.7 mm from the left and bottom edges of the page. If the tickmarks are off, use this option to align the image horizontally and vertically in pixel increments ($\frac{1}{300}$" or .08 mm), from 000 to 300 pixels (300 pixels = 1" or 25.4 mm). The factory default setting is 100. Values above 100 move the image to the right (for horizontal alignment) or down (for vertical alignment); values below 100 move the image left (for horizontal alignment) or up (for vertical alignment). See "Entering Alphanumeric Values," earlier in this chapter, if you're not sure how to enter a number in the message window.

NOTE: Engine constraints may limit the accuracy of pixel alignment.

Administration/Engine/Default Paper
Default Paper specifies a media size for the printer to use if it does not recognize the size specified for a job. The choices are letter and A4. The factory default is letter. Change the default to A4 if you print on metric-size media.

Administration/Engine/Inputbin 1 Name
Use this option to assign a name to the standard paper cassette (input bin). For example, you may want to name it "Letterhead" if you always keep letterhead paper in that cassette. The factory default is upper.

Administration/Engine/Inputbin 2 Name
Use this option to assign a name to the optional lower cassette (input

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bin). For example, you may want to name it “Plain” if you always keep plain paper in that cassette. The factory default is lower.

Administration/Engine/Outputbin Name
Even though there is only one output bin (the output tray), you may want to use this option to assign a name to the outputbin on the top of your printer. The factory default is upper.

Administration/Engine/Clear Warning
Use this option to clear a status message that doesn’t automatically clear after the related corrective action is taken; for example, `TOP COVER OPEN` clears after you close the top cover, but `REPLACE BELT` does not clear automatically after a new OPC belt cartridge is installed. Options in this menu include all status messages that don’t automatically clear. Select the message that you want to clear after correcting the specified status. See “Status Messages” in chapter 9 for details.

NOTE: If you clear `REPLACE FUSER` or `100K CHECKUP`, the counter that tracks that particular service resets to 0 and the message does not reappear until after another complete cycle. If you continue to use the printer without the proper maintenance or part replacement, print quality can deteriorate, and the wear on the printer can shorten the printer’s life.

Administration/Engine/Default Resolution
This option allows you to choose either 600 or 300 dpi printing. The factory default setting is 600 dpi. If you purchased a printer with 12 MB RAM, you can print color or monochrome documents in 300 dpi or you can print monochrome documents in 600 dpi. You must upgrade printer RAM to be able to print color documents in 600 dpi. (See appendix B, “Technical Specifications,” for specific information on RAM requirements and color resolution.) If you want to print 600 dpi monochrome documents on a printer

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with 12 MB RAM, make sure you select Monochrome in the Operator Control/Color Model menu. Also, if you change the resolution, you should choose the appropriate halftone setting and gamma correction setting for best results.

Administration/Engine/Page Recovery
Use this option to enable or disable page recovery. The default is enabled. Enabling page recovery causes the printer to automatically reprint jammed pages (as long as the printer is not turned off while the jammed is being cleared). You may want to disable jam recovery to free up printer memory, and enhance performance.

Administration/Engine/Manfeed Timeout
This refers to the number of seconds the printer waits for media to be inserted in the manual feed slot before abandoning the job. This variable has a minimum value of 00000 (no timeout), a maximum of 00300, and a factory default of 00060.

Administration/Engine/Energy Saver
The Energy Saver option specifies whether the printer changes to a lower-power state (the engine remains on, but the fuser turns off) after the printer is inactive for a user-defined length of time. The options are Off, 15 minutes, 30 minutes, 1 hour, 2 hours, or 3 hours (of idle time before activation of low-power state). The factory default setting is 60 minutes. If you have an **Energy Star** version of the printer (look for a label with the Energy Star logo on the back of the printer), Energy Saver causes printer power consumption to drop to less than 45 W. If you don't have the Energy Star version of the printer, then Energy Saver causes printer power consumption to drop to about 147 W. When a print job is received, the printer returns to normal power in about 90 seconds.

NOTE: The addition of some optional interfaces, in some combinations, may cause the product to become non-Energy Star compliant.

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Administration/Miscellaneous

The Miscellaneous menu (fig. 4.12) allows you to restore factory defaults, protect current defaults, and choose a message window language.

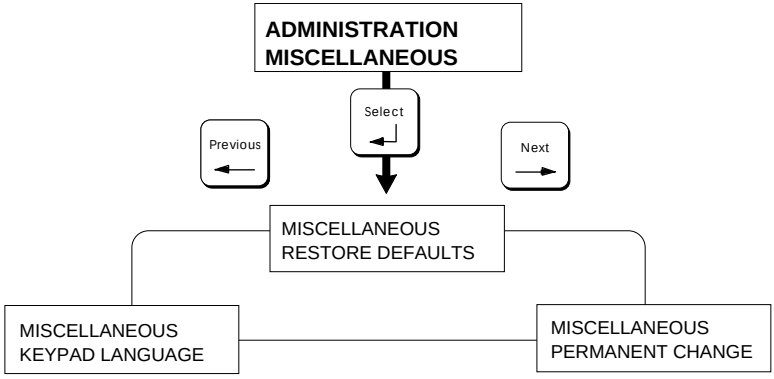

Fig. 4.12 *Miscellaneous Submenu*

Administration/Miscellaneous/Restore Defaults

This option allows you to reset all configuration values to their original factory defaults. The choices are yes and no; the factory default is no. During this process, which takes several minutes to complete, the printer reinitializes itself.

If the Configuration menu locks up and you cannot access this option, you can reset all configuration values to their factory defaults by simultaneously holding down the and Online/Offline keys (for about 10 seconds) while turning the printer off and on again.

Administration/Miscellaneous/Permanent Change

If set to off, this option prevents a print job from making permanent

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configuration changes to the printer's non-volatile memory. PS Executive Series Utilities (the host software that comes with your printer) is an example of a program that generates print jobs to change the printer's non-volatile memory, where printer defaults are stored. Non-volatile means data in this memory remains even if the printer is turned off and back on. Setting this option to on allows print jobs to change the non-volatile memory. The choices are on and off; the factory default is off.

Administration/Miscellaneous/Keypad Language

This option allows you to set the language in the message window to English, French, German, or Spanish. The factory default message window language is English. Changing the keypad language will cause the printer to re-initialize automatically.

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Administration/Disk Operations

This menu (fig. 4.13) controls the internal hard disk as well as any optional hard disk(s) attached to the printer's SCSI port. See chapter 8, "Printer Options," for more information about using the Disk Operations menu. The *QMS Crown Technical Reference* (an optional manual available from your QMS vendor) also contains information about hard disks.

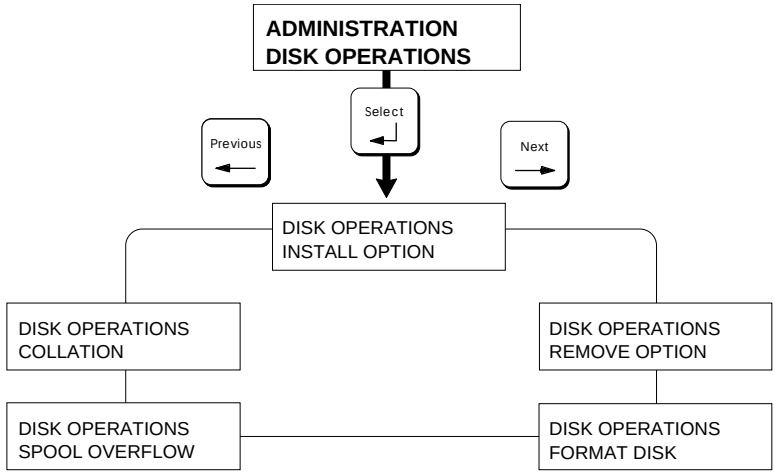

Fig. 4.13 *Disk Operations Submenu*

NOTE: If an error occurs during disk operations, an error message displays until the Menu key is pressed. The operation must then be restarted from the beginning. Two error messages you may see are `READ FAILURE` (the drive has encountered a read error) and `WRITE ERROR` (either the hard disk had a write error or there is no room for data on the hard disk or in RAM).

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CAUTION: If you connect to this printer an external hard disk you previously used with an earlier QMS Crown printer, this QMS *magicolor* LX printer software automatically reorganizes the files on the hard disk when the printer is turned off and back on again. After this reorganization, the files on the hard disk can no longer be accessed if the hard disk is reattached to the earlier QMS Crown printer. This reorganization takes time. Don't interrupt the reorganization, because all files on the disk might be lost.

Administration/Disk Operations/Install Option
The Install Option command is used to add options, such as fonts and emulations, to the hard disk. See "Installing an Optional Card Font or Emulation" in chapter 8 for more details.

Administration/Disk Operations/Remove Option
The Remove Option command is used in removing options previously installed on the hard disk. Selecting this option removes all the files that are a part of the option. See "Removing an Optional Card Font or Emulation" in chapter 8 for more details.

Administration/Disk Operations/Format Disk
The Format Disk command is used to format a hard disk.

If the `FORMAT FAILED` message displays in the message window during the Format Disk operation, the disk cannot be used. Press the Menu key to remove the message and contact your QMS vendor. See "Formatting the Internal Hard Disk" and "Formatting an External Hard Disk" in chapter 8 for more details.

Administration/Disk Operations/Spool Overflow
The Spool Overflow submenu allows you to specify which disk and how much disk space is to be used to spool print jobs when the job cannot be accommodated by RAM. Memory for spool buffers is defined in the K Mem for Spool menu option (in the Administration/Memory menu, which is explained earlier in this

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chapter). The printer must be turned off and on again for the new value to take effect.

Size (Meg) Use this option to choose the number of megabytes of disk space allocated (in addition to RAM) to spool print job data. Values range from 0 to 256 with a default of 10 MB.

Location Use this option to specify which disk to use for temporary spooling storage when an additional hard disk is available. The choices are DSK0 through DSK6 (the internal hard disk, the default).

Administration/Disk Operations/Collation

The Collation submenu allows you to specify which disk and how much of that disk should be used to store collated print jobs when the jobs can't be accommodated by RAM. Collation is selected in the Operator Control/Collation menu (described earlier in this chapter). Turn the printer off and back on again for the value to take effect. (See "Collating" in chapter 5, "Print Media and Daily Operations" for more details.)

Size (Meg) Use this option to choose the number of megabytes of disk space allocated (in addition to RAM) on which to store collated print jobs. Ten megabytes of collation disk space is probably sufficient for most printing applications. Values range from 00 to 50 with a default of 10 MB.

Location Use this option to specify which disk to use for temporary storage of collated jobs when an additional hard disk is available. The choices are DSK0 through DSK6 (the internal hard disk, the default).

The Optional Features Menus

If you install a printer option (for example, a network interface card), it may affect printer configuration and the Configuration

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menu. Depending on what option you install, you may have new menus and options in the Configuration menu, which allow you to control the new option. See the documentation accompanying your option to learn exactly how it affects the Configuration menu.

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Document Option Commands

Your printer offers a wide range of capabilities for designing and printing documents. However, applications and printer emulations differ in their ability to access some of these document printing capabilities. Document Option Commands (DOCs) provide a way to access printer features that cannot be accessed by your application or your printer emulations.

System administrators can use DOCs along with the host's network management software to generate personalized header pages for custom print queues or to activate special printer features for each user.

Following is a list of DOCs supported by the QMS *magicolor* LX printer. For more information on these commands, see *QMS Crown Document Option Commands*, an optional manual available from your QMS vendor.

Header/Trailer Page Commands

Header pages	%%IncludeFeature: header
Trailer pages	%%IncludeFeature: trailer

Header/Trailer Information Commands

Application used	%%Creator:
Copyright statement	%%CopyRight:
Current date	%%Date:
Date and time created	%%CreationDate:
Host computer	%%Host:
Owner	%%For:
Routing information	%%Routing:
Title	%%Title:
Version and revision	%%Version:

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HP-GL Emulation Features Commands

Enhanced mode	%%IncludeFeature: enhanced
Expanding plots	%%IncludeFeature: expand
Original paper size	%%IncludeFeature: size
Pen width and color selection	%%IncludeFeature: pen
Plotter selection	%%IncludeFeature: plotter
Reverse image	%%IncludeFeature: reverse
Scaling plots	%%IncludeFeature: scaling
Shifting origin	%%IncludeFeature: origin

HP-PCL Emulation Features Commands

Carriage returns*	%%IncludeFeature: criscrlf
Font selection*	%%IncludeFeature: font
Font by id*	%%IncludeFeature: fontid
Font storage*	%%IncludeFeature: resource
Line feeds*	%%IncludeFeature: lfiscrlf
Lines per inch*	%%IncludeFeature: linesperinch
Point size*	%%IncludeFeature: pointsize
Remove from disk*	%%IncludeFeature: remove
Reset to defaults	%%IncludeFeature: reset
Symbol set*	%%IncludeFeature: symbolset
Retain temporary macros/fonts	%%IncludeFeature:retaintemporary
Select monochrome	%%IncludeFeature:monochromegl
Enable scalable fonts*	%%IncludeFeature:scalablefonts
Establish resource/def. object ID*	%%IncludeFeature:install

*Indicates a DOC about which updated information is provided in appendix D, “Additional Technical Information.”

Lineprinter Emulation Features Commands

Automatic text wrap	%%IncludeFeature: autowrap
Carriage returns	%%IncludeFeature: criscrlf
Font selection	%%IncludeFeature: font
Form feed	%%IncludeFeature: ffiscrff
Line feeds	%%IncludeFeature: lfiscrlf
Lines per page	%%IncludeFeature: linesperpage

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Map using ASCII or EBCDIC	%%IncludeFeature: map
Margins	%%IncludeFeature: lpmargins
Number on for 5-digit numbers	%%IncludeFeature: number
Orientation	%%IncludeFeature: lporientation
Point size	%%IncludeFeature: pointsize
Tabs selection	%%IncludeFeature: tabs

PostScript Emulation Features Commands

Choose Level 1 or 2	%%IncludeFeature: languagelevel
Default dither pattern	%%IncludeFeature: ditherdefault

Printer Features Commands

Collating print jobs	%%IncludeFeature: collate
Color model selection	%%IncludeFeature: colormodel
Color separations	%%IncludeFeature: colorseparation
Copies, number of	%%IncludeFeature: numcopies
Emulation selection	%%IncludeFeature: emulation
Media type selection	%%IncludeFeature: mediatype
Orientation selection	%%IncludeFeature: orientation
Paper selection	%%IncludeFeature: input
Output tray selection	%%IncludeFeature: output
Resolution selection	%%IncludeFeature: resolution

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Chapter 5

Print Media and Daily Operations

Chapter highlights:

- Refilling the media cassette
- Manual feed
- Printing transparencies
- Printing labels
- Printing on preprinted and prepunched media
- Printing envelopes
- Printing on thick paper stocks
- Page sizes, imageable regions, and margins
- Selecting and storing print media
- Collation
- Changing printer resolution
- Adjusting print density
- Cancelling and ending print jobs
- Using diagnostic and special pages

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Introduction

This chapter covers print media handling, printing, and other daily printing operations.

Refilling the Media Cassette

This section explains how to refill the paper cassette.

To see illustrations of the steps described in this section, see chapter 2, “Initial Printer Setup.”

1. Pull the paper cassette out of the printer.
2. Make sure the cassette size key (the slide on the back end of the cassette) is set for the media size that you’re loading (fig. 5.1).

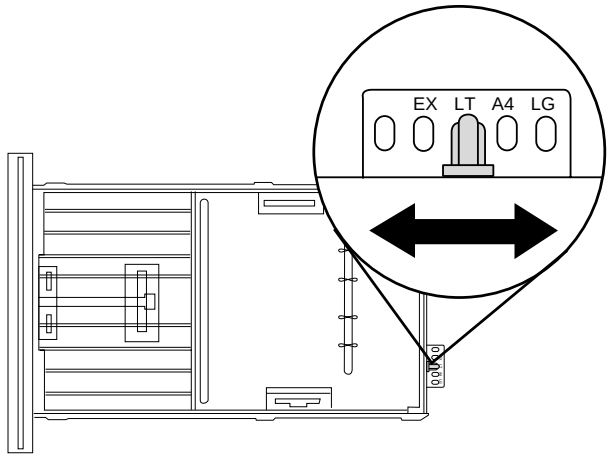

Fig. 5.1 *Set the Cassette Size Key*

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3. From the wrapping, determine which is the printing side of the media; then remove a stack of media 1" (approx. 27 mm) or less.

   If you're using paper, fan it to prevent the sheets from sticking together. (Don't fan transparencies or labels because this can cause jams.)

4. Align the edges of the stack on a flat surface and load it in the cassette so the top edge will lead into the printer and the printing side is up.

   You can load up to 250 sheets of paper or 50 transparencies. Label stock varies in thickness; just make sure it does not exceed the upper-limit load mark on the cassette.

5. Adjust the paper guides on each side of the media so that they rest lightly against it without causing it to buckle.

6. Slide the filled cassette into the printer until it is flush with the front of the printer.

NOTE: Make sure the printer is configured for the media type (paper or transparency) you have in the cassette or print quality could degrade. Media type can be selected through the printer's front panel.

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Manual Feed

You can feed a single sheet at a time to the printer using the manual-feed tray. This allows you to print on a different media type without changing the media in the cassette, or to print on media not supported by the standard cassette (envelopes or thick stock).

1. Use your application's print setup feature to select the manual-feed tray and the media type you plan to use (paper or transparency).

   If your application doesn't allow this, you can do it at the printer front panel:

   a. Press the Tray Select key until the Manual Feed LED is lit.

   b. Press the Media key until the LED for the media type you want (paper or transparency) is lit. (Choose the Paper setting for label and envelope printing.)

      If you're printing on thick stock (paper that's between 24 and 43 lb [90 g/m^2 and 163 g/m^2]), then use the Operator Control/Media menu to select this media type.

NOTE: If you select media type from the driver, the tray you're printing to must already have been set from the printer's front panel for the desired media type.

2. Use your application's print setup feature to select any other printing options you want.

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3. Open the manual-feed tray by lightly pressing on the top-right corner to release the spring latch (fig. 5.2) and then tilting the tray out and down.

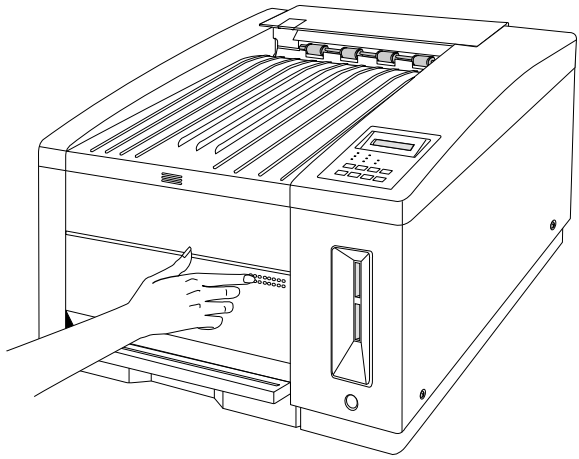

Fig. 5.2 *Open the Manual Feed Tray*

4. Move the paper guides on the manual feed tray to fit the size of the chosen media.

5. Determine the printing side of the media (an arrow on the media wrapping should point to the printing side). Make sure the media is in good condition, free of folds, tears, and wrinkles.

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6. Insert a single sheet of media, printing side up, with the top edge leading into the printer, in the manual feed tray (fig. 5.3) until it reaches the rear of the tray inside the printer and lies flat.

   If you're printing envelopes, load the envelopes printing-side up, so that the flap side will be on the left when the envelope is pulled into the printer.

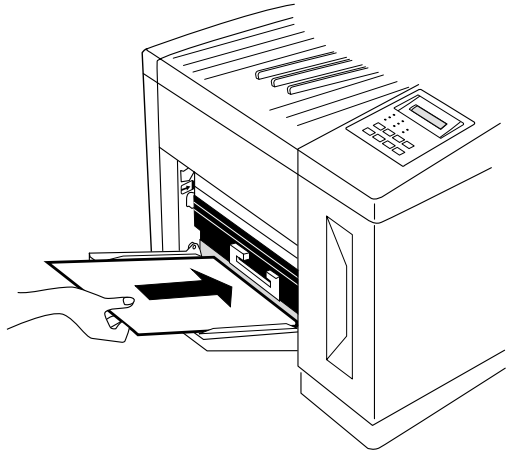

Fig. 5.3 *Insert a Single Sheet*

7. Through your application, print your document.

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Printing Transparencies

1. See "Refilling the Media Cassette" or "Manual Feed," earlier in this chapter, for information on loading media.

2. If you haven't previously, set up the tray you want to use for transparency printing:

   a. At the printer front panel, press the Online/Offline key.

   b. Press the Tray Select key until the LED for tray you want to use for transparencies is lit on the front panel.

   c. Press the Media key until the Transparency LED is lit on the front panel.

   d. Press the Online/Offline key.

3. Use your application's print setup feature to select Transparency printing, and select any other printing options you want.

   If you're printing from a Windows or a Macintosh application, you can select transparency printing from your application if you use the QMS-supplied Windows or Macintosh driver. See chapter 3, "Connecting the Printer," for information on installing the driver. Then, in the driver, select Overhead from the QCOLOR setup options to print from the tray you set up for transparencies. (You can select any of the QCOLOR color setup options for transparency printing if you select the Transparency option in the Color Setup dialog box in the Windows driver—or, in the Macintosh driver, select Transparency from the Media listbox—without changing any other options. If you do this, the Customize option will appear in the QCOLOR setup listbox.)

NOTE: Any time you select a media type from the driver, the tray you're printing to must already have been set from the front panel for the desired media type.

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4. Send your job.

Printing Labels

For best results when printing labels, format labels through your application and then run a test print on plain paper to check formatting and avoid wasting label sheets.

1. See "Refilling the Media Cassette" or "Manual Feed," earlier in this chapter, for information on loading media in the cassette. Make sure you place the labels printing-side up with the top edge feeding into the printer first.
2. If you haven't previously, set up the tray you want to use for printing on Paper:
   a. At the printer front panel, press the Online/Offline key.
   b. Press the Tray Select key until the LED for tray you want to use for labels is lit on the front panel.
   c. Press the Media key until the Paper LED is lit on the front panel.
   d. Press the Online/Offline key.
3. Use your application's print setup feature to select Paper printing and any other printing options you want.

NOTE: Any time you select a media type from the driver, the tray you're printing to must already have been set from the front panel for the desired media type.

4. Send your job.

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Printing on Letterhead or Other Preprinted Media

Print letterhead or other preprinted media the same way labels are printed. Make sure you place the media printing-side up with the letterhead edge feeding into the printer first.

Printing on 3-Hole or Other Pre-punched Media

Print 3-hole or other pre-punched media the same way labels are printed. Make sure you place the media printing-side up with the top edge feeding into the printer first.

Printing Envelopes

Envelopes can be printed from the manual-feed tray or from the optional envelope cassette. If you purchased the optional envelope cassette for your printer, see "Using the Envelope Cassette" in chapter 8, "Printer Options."

To print envelopes from the manual-feed tray, see "Manual Feed," earlier in this chapter. Envelopes are loaded with the printing side up, so that the top of the envelope (the flap side) is on the left as the envelope is pulled into the printer.

Printing on Thick Paper Stocks

To print on heavy paper stocks (between 24 and 43 lb [90 g/m^2 and 163 g/m^2]

1. Set up the manual-feed tray for printing thick stock:

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a. Press the Online/Offline key to take the printer off line. (The Online/Offline LED goes out and `IDLE` appears in the message window.)

b. Press the Menu key to enter the Configuration menu. Then press the Next key until the following message displays:

```
CONFIGURATION
OPERATOR CONTROL
```

c. Press the Select key to choose the Operator Control menu. Then, press the Next key until the following message displays:

```
OPERATOR CONTROL
MEDIA
```

d. Press the Select key to enter the Media menu; then press the Next key until the following message displays:

```
MEDIA
FOR MANUAL BIN
```

e. Press the Select key to enter the Manual Bin menu; then press the Next key until Thick Stock appears in the message window:

```
FOR MANUAL BIN
THICK STOCK
```

f. Press the Select key to choose Thick Stock.

g. Press the Online/Offline key to exit the Configuration menu or press the Menu key to back out of the Configuration menu one level at a time. The message window displays

```
SAVE CHANGES?
*NO
```

h. Press the Next key until Yes appears in the message window; then press the Select key. The following message displays

```
OFFLINE
```

i. Press the Online/Offline key to put the printer back on line. (The Online LED lights.)

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2. See “Manual Feed,” earlier in this chapter, for instructions on feeding media manually to the printer.

Page Sizes, Imageable Regions and Margins

Page Sizes

Your printer can print on the following media sizes: letter, legal, executive, A4, and envelopes (DL and COM 10). (Appendix B, “Technical Specifications,” lists measurements for each of these sizes.)

Imageable Regions and Margins

Each size has a certain imageable region—the maximum page area the printer can print on. The imageable region is subject to hardware limits (physical page size and margins required by the printer engine) and to software constraints (amount of printer memory available). As you set page margins in your application, remember that they must be equal to or fall inside the printer’s imageable region for the page size you’re using. (Appendix B, “Technical Specifications,” lists measurements of imageable regions and margins for each media size.)

About Legal-Sized Imageable Region

There are two imageable regions for legal-sized pages: one for black and one for color. The imageable region for black on legal-sized pages is 8.11" x 13.61" (205.90 mm x 345.60 mm). The imageable region for color on legal-sized pages is an 8.11" x 11.7" (205.90 mm x 297.18 mm) region at the top of the page. We recommend that you compose color legal-sized pages so that color images stay in this 8.11" x 11.7" area near the top of the page, and use the imageable region below this for black only.

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Working Within Imageable Regions and Margins

If you experience problems with your file being cut off (not printing to the expected margins), it might be due to an imageable region constraint. There are two ways to compensate for imageable region constraints:

1. Adjust margins, page size, or scale through your application.
2. Use the PostScript **translate** and **scale** operators to reduce image size and change its placement on the page. The *QMS Crown Technical Reference* (an optional manual available from your QMS vendor) contains information on using PostScript operators.

Selecting and Storing Media

Media Selection

Media versatility is one of the biggest benefits of the QMS *magicolor* LX printer. It can print on plain or laser paper, transparencies, labels, envelopes and thicker stocks (between 24 and 43 lb [90 g/m^2 and 163 g/m^2].

Make sure that the media you select meets the specifications listed in the "Media Handling" section of appendix B, "Technical Specifications."

Media Storage

Store media according to the manufacturer's instructions to optimize printer output and decrease the chance of jams during printing. See appendix B, "Technical Specifications," for additional media storage recommendations.

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Collating

Collating means printing multiple copies of a job in numeric order. The printer can deliver multiple copies of your files in collated order to the top cover. Figure 5.4 illustrates collated and uncollated stacking for two copies of a four-page file. You can select collating through your application, if its driver supports this option (such as the QMS-provided Macintosh or Windows driver), or through the printer front panel (see chapter 4, “Printer Configuration,” for information).

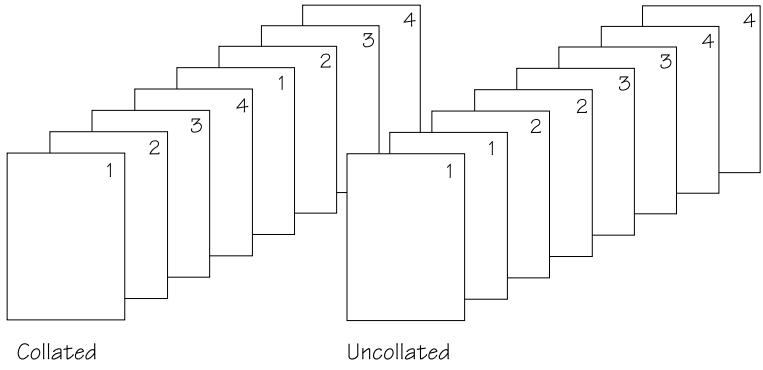

Fig. 5.4 *Collated and Uncollated Output*

Configuring the Printer for Collation

Since a hard disk is already installed, using the hard disk for collation instead of system RAM greatly improves performance. To specify which disk and how much of that disk should be used for storing collated print jobs, use the Administration/Disk Operations/Collation menu.

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The increased disk space allows more complex and longer collation sequences. However, there's a limit on how much can be collated at one time. When 100 sheets are received for a print job, or when a complex print jobs consumes all the collation disk space, chunk collation occurs.

Chunk collation breaks a print job into smaller, more manageable collation sections. For example in figure 5.5, copies "a" and "b" of each collation section must be manually combined to create one collated print job.

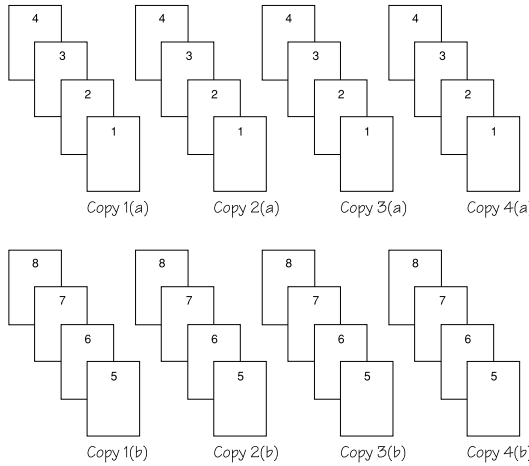

Fig. 5.5 *Chunk Collation*

The main advantages of collation are user convenience and time saved from not having to separate and sort individual copies of a print job. Each copy exists as a whole unless chunk collation occurs. If you print multiple jobs and choose collating, you may want to add header and trailer pages to separate the jobs. (See the "Administration/Special Pages" section in chapter 4 for details on how to print header and trailer pages.)

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Changing Print Job Resolution

You can configure the printer to use either 600 or 300 dpi resolution. This can be done through your application, if its driver supports this option (such as the QMS-provided Macintosh or Windows driver), or through the printer front panel (see chapter 4, "Printer Configuration," for information).

If you purchased a printer with 12 MB RAM, you can print color or monochrome documents in 300 dpi or monochrome documents in 600 dpi. To print monochrome documents in 600 dpi with 12 MB RAM, in addition to configuring the printer for 600 dpi resolution, you must also configure it for monochrome printing. This can be done through your application or through the printer front panel (Administration/Engine/Default Resolution and Operator Control/Color Model menus).

To print color documents in 600 dpi, you must install additional RAM in the printer. See appendix B, "Technical Specifications," for specific information on RAM requirements and color resolution.

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Adjusting Print Density

Normally, your laser printer produces a rich black or color image. However, you may occasionally notice a color is printing a bit light or dark. In this case, you may want to increase the print density (or contrast) setting for that color.

NOTE: Changing the print density affects the resident color management system and should be done only as a last step to improve print quality. The normal setting is the center position.

Each toner color has its own adjustment dial, so you can adjust colors individually. To change density settings, use the following procedure:

1. Remove the top cover by lifting it up and out. Then, set the cover aside for now.

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2. Locate the adjustment dials inside the printer to the front left (fig. 5.6).

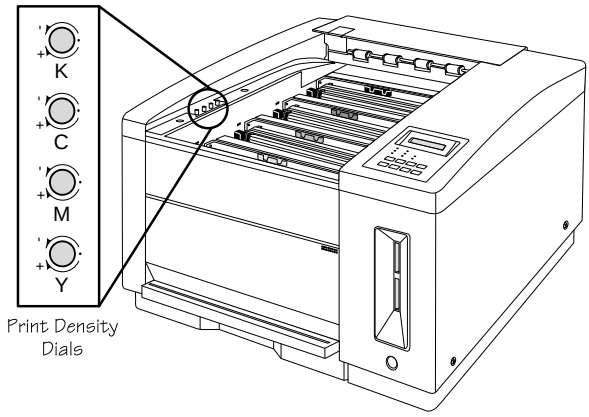

Fig. 5.6 *Print Density Adjustment Dials*

3. Turn the density adjustment dial to the left (counterclockwise) to lighten the print or to the right (clockwise) to darken the print.

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Cancelling and Ending Print Jobs

The Cancel key allows you to cancel the “oldest” job(s) compiling or printing in the printer, or to send an end-of-job indicator for a print job.

NOTE: If you accidentally press the Cancel key, press the Menu key to tell the printer to stop cancelling a job.

Cancelling a Print Job

To cancel a job currently printing or compiling data, use the following procedure:

1. Press the Cancel key. The following message displays in the message window:

   ```
   CANCELLING JOB?
   YES
   ```

2. Press the Select or Cancel key to confirm your choice. The message

   ```
   YES
   IS SELECTED
   ```

   displays briefly. Then

   ```
   CANCELLING JOB
   ```

   displays until the job currently printing or compiling data is removed from the printer.

Sending an End-of-Job Indicator

To send an end-of-job indicator to the currently compiling job if

```
WAITING FOR INPUT
END JOB?
```


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displays in the message window, use the following procedure:

NOTE: Selecting End Job won't end a job that is still receiving data. Its only purpose is to provide an end-of-job indicator for jobs that do not have one.

1. Press the Cancel key. The following message displays in the message window:

   ```
   CANCELLING JOB?
   YES
   ```

2. Press the Next key. The following message displays:

   ```
   CANCELLING JOB?
   END JOB
   ```

3. Press the Select or Cancel key to confirm that jobs waiting for input are ended.

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Diagnostic and Special Pages

There may be times when you want to check the current status of your printer, adjust the quality of your printed copy, or monitor print jobs. To help you do this, the printer has several types of diagnostic and special pages. These include the start-up page, status pages (standard and advanced), the registration, and sample pages, and the header and trailer pages.

The Start-up Page

When you turn on your printer a start-up page prints in approximately 4 minutes (unless you disable this feature). This page gives the following information about the printer:

- The printer name
- The PostScript Level 2 emulation version number
- The firmware revision number
- The interface port settings (emulation, communication protocols)
- The number of typefaces stored in the printer
- The number of pages printed to date
- The amount of resident RAM
- The printer name (user-definable through PS Executive Series Utilities)
- A color block for each of the process colors
- The current halftone selected
- The highest possible resolution (for monochrome and four-color jobs) that can be printed on the currently

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selected page size with the amount of printer RAM currently installed

Disabling the Start-up Page

After you install the printer and establish communication between the printer and the host, you may want to disable the start-up page to conserve toner, developer, and print media. You can do this through the printer front panel (see chapter 4, “Printer Configuration”) or through PS Executive Series Utilities (see the on-line help).

The Status Pages

There are two types of status pages, the standard status page (1 page that gives the general setup), and the advanced status page (5 or more pages that lists all menu settings and fonts and emulations). You select the type (standard or advanced) to print through the Administration/Special Pages/Status Page Type menu. Then, you can print the selected type through the front panel Administration/Special Pages/Print Status menu. (See chapter 4, “Printer Configuration,” for details on printing from the front panel.)

The standard status page lists printer identification information and settings, current memory configuration, timeout values, communication settings, input buffer sizes, and the hard disk(s) status.

The standard status page also has alignment tickmarks in the lower-left corner. When the printer is properly aligned, these marks are 0.5" from the left edge and 0.5" from the bottom of the page. Use the Image Alignment option (located in the Administration/Engine menu), described in chapter 4, “Printer

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Configuration," to change the placement of images on the page if necessary.

The advanced status page has the same information as the standard status page, plus it lists configuration menu settings, fonts, and loadable emulations.

NOTE: The sizes listed on the status pages are in bytes, so you must divide the numbers on the status pages by 1024 to get the equivalent number of kilobytes entered through the front panel.

The Sample Page

You can print a sample page through the front panel Administration/Special Pages menu. This page lists the current default halftone settings for the printer, and allows you to see the effect of the currently selected default halftone on shades of cyan, magenta, yellow, black, blue and green.

The Registration Page

You can print a registration page through the front panel Administration/Special Pages menu. This page allows you to check color registration (placement of each of the process colors on the page). You also can print a registration page through PS Executive Series Utilities. See the utilities on-line documentation for more details, and see chapter 9, "Troubleshooting," for information on troubleshooting registration problems.

Header and Trailer Pages

Header and trailer pages help you monitor individual jobs. Think of them as an accounting or tracking system.

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For example, the header (or banner page) contains the printer name, selected interface, job identification, title, submitting computer, job owner, routing message, start time/date, application used, creation time/date, copyright date, version number, job submission time, job start time, and printer product name/logo.

You can enable a header page through the front panel Administration/Special Pages/Header Page menu. See chapter 4 for details.

Trailer pages contain the printer's name, selected interface, job identification, title, submitting computer, job owner, routing message, start time/date, application used, creation time/date, copyright date, version number, job submission time, job start time, job finish time, number of sheets printed, and printer product name/logo. The trailer page also lists any printer errors generated while processing or printing your document.

You can enable a trailer page through the Administration/Special Pages/Trailer Page menu. See chapter 4, "Printer Configuration," for details.

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Chapter 6

Consumables and Preventative Maintenance

Chapter highlights:

- Storing and replacing consumables
- Moving the printer
- Performing preventative maintenance

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Introduction

This chapter covers storing and replacing major consumables and performing preventative maintenance on your printer.

Storing and Handling Consumables

This section covers storing and handling the major consumables for your printer except for print media. Print media is covered in chapter 5, “Print Media and Daily Operations.”

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Storing Consumables

Table 6.1 covers storage specifications for toner, developer, and OPC belt cartridges.

Storage Specifications Toner, Developer, and OPC Belt Cartridges		
Characteristic	**Normal Conditions***	**Severe Conditions****
Temperature	32˚ to 95˚ F (0˚ to 35˚ C)	Low 14˚ to 32˚ F (-10˚ to 0˚ C) High 95˚ to 104˚ F (35˚ to 40˚ C)
Humidity	10-80% RH	80-90% RH
Period of Storage	2 years after production date (includes operation life)	
Storage Conditions	Unopened in a cool, dry, well-ventilated, dark place. Away from direct sunlight, corrosive gases, and solvents (alcohol, thinner, diazole). Away from liquids.	
* More than 90% of the entire storage period. ** Less than 10% of the entire storage period; 48 continuous hours at most during any one period.		

Tab. 6.1 *Storage Specifications for Cartridges*

Handling Consumables

The following list covers handling the consumables for your printer.

WARNING! Toner and developer are highly combustible; never burn them. Also, avoid inhaling loose powder or getting it around your eyes; it can cause respiratory problems and eye irritation.

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ACHTUNG! **Bei Entwickler und Toner handelt es sich um gefährliche Pulver, die leicht entzündlich sind; sie dürfen deshalb niemals mit offenem Feuer in Berührung kommen. Einatmen oder Berührung mit Haut und Augen ist ebenfalls zu vermeiden, da dieses zu Beeinträchtigungen der Atemwege, Haut- oder Augenreizungen führen könnte.**

Handling Conditions

Toner and Developer Cartridges

Dispose of toner and developer in a safe manner, meeting all local and federal regulations.

Handle only one color of toner and developer at a time to avoid contaminating other colors.

Use a toner vacuum to clean up powder spills in the printer, if necessary.

If toner gets on your hands or clothing, lightly dust off as much as possible. If some remains, rinse your hands or washable clothing with cool water (hot water sets toner) to remove the rest.

OPC Belt Cartridge

Do not touch the belt with your hands; hold the cartridge by its green end-handle or the two green side-handles.

Do not expose the belt to direct sunlight.

Do not expose the belt to room light for longer than 2 minutes.

Keep the belt surface free of foreign material, such as dust, solvents, moisture, or corrosives.

Avoid abrupt changes of temperature and humidity for the cartridge.

Keep exposure to casual light to a minimum; for example, remove the top cover of the printer only when necessary and replace the cover as soon as possible.

Reinstall the pressure release and tension release pin sets (one on the left side and one on the right) in the

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cartridge if it will be out of the printer for any extended time period. These pins protect and relieve tension on the belt and cleaning blade.

Replacing Consumables

This section explains how to replace the consumables, including toner, developer, OPC belt cartridges, cleaning pad, oil bottle, and waste toner pack. If you want to see illustrations of all the steps described in this section on replacing consumables, see chapter 2, "Initial Printer Setup."

NOTE: When you see status messages, including those regarding consumables, you do not have to turn off the printer unless the message calls for service intervention.

Replacing a Toner Cartridge

This section covers replacing a toner cartridge in your printer. You should replace a toner cartridge when the *x* TONER EMPTY message displays in the message window on the control panel. The *x* represents the color of the empty toner cartridge.

The industry standard for toner measurement is quoted at 5% coverage for letter- or A4-size media.

NOTE: Occasionally, you may see the *x* TONER EMPTY message when there is still toner in the cartridge, but the toner has merely settled so it can't distribute evenly. This may happen if the printer sits without use for over several days. If you think this may be the case, remove the current cartridge, shake it horizontally to redistribute the toner, and place the cartridge back in the printer. Then, run a

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test file for that color to see if it prints correctly. This procedure can extend the life of your cartridges.

To replace a toner cartridge, use the following procedure:

1. Remove the top cover (fig. 2.5).

WARNING! **The toner is a highly combustible powder; never burn it. Also, avoid inhaling loose toner or getting it around your eyes; it can cause respiratory problems and eye irritation.**

ACHTUNG! **Bei dem Toner handelt es sich um ein gefährliches und leicht entzündliches Pulver; es darf deshalb niemals mit offenem Feuer in Berührung kommen. Einatmen oder Berührung mit Haut und Augen ist ebenfalls zu vermeiden, da dies zu Beeinträchtigungen der Atemwege, Haut- oder Augenreizungen führen könnte.**

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2. Remove the old toner cartridge by holding it across the center, squeezing the sides to loosen the pins on the back side from the developer cartridge notches. Then, lift the toner cartridge straight up and out of the printer (fig. 6.1), and dispose of it following safety laws and regulations.

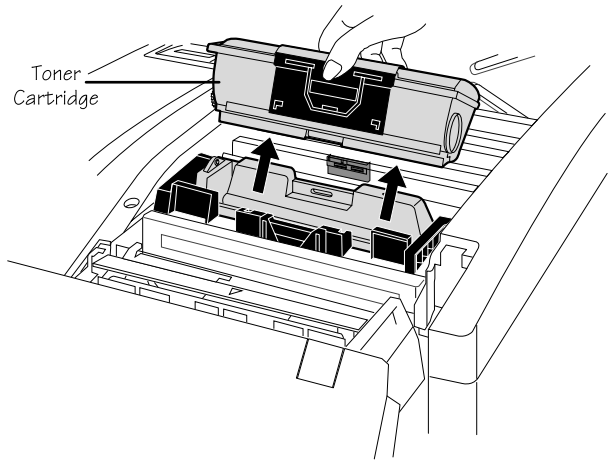

Fig. 6.1 *Remove the Old Toner Cartridge*

3. Remove the new toner cartridge from its protective bag. (Toner cartridges are color-coded on the top. Be sure you have the correct color cartridge.)

4. Hold the cartridge by the ends, and shake it horizontally (fig. 2.10). This distributes toner evenly inside the cartridge and helps assure quality printing.

5. Hold and squeeze the toner cartridge across the center, and align it with the developer cartridge of the corresponding color (fig. 2.11). Make sure the toner cartridge's color-coded pins line up with the notches on the developer cartridge.

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CAUTION: Never force a toner cartridge onto the wrong developer cartridge. This can damage the cartridges and the printer.

6. Lower the toner cartridge until it fits firmly onto the notches on the developer cartridge.
7. Press the top of the toner cartridge until it snaps into place under the two securing latches.
8. Grasp the tab on the top of the toner cartridge.
9. Holding the toner cartridge in place, pull the tab and attached clear tape straight up and completely out of the cartridge (fig. 2.12). Then discard the tape.
10. Set the print density dial (fig. 5.6) for the changed toner cartridge in the center if necessary.
11. Replace the printer's top cover.

Replacing a Developer Cartridge

A message on the control panel window, *X* `DEV LOW` indicates when it is time to change a developer cartridge. The *x* indicates which color should be changed. Cyan, yellow, and magenta developer cartridges last for approximately 15,000 pages, and black developer cartridges last for approximately 30,000 pages.

NOTE: The industry standard for developer measurement is quoted at 5% coverage for letter- or A4-size media.

To replace a developer cartridge, use the following procedure:

1. Remove the printer's top cover (fig. 2.5).
2. Remove the toner cartridge by holding it across the center, squeezing the sides to loosen the pins on the back side from the developer cartridge notches (fig. 6.1). Then, lift the toner cartridge straight up and out of the printer.

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3. Set the toner cartridge aside for now, being careful to keep it level. Also, be sure to place it on something, such as a large sheet of paper, to catch loose residue.

4. Grasp the green latches at each end of the used developer cartridge and raise them straight up to open them.

5. Release the developer cartridge from its securing latches by pressing back on the latches while pulling forward on the cartridge (fig. 6.2). The securing latches are color coded (black, cyan, magenta, or yellow) to the color of the developer cartridge.

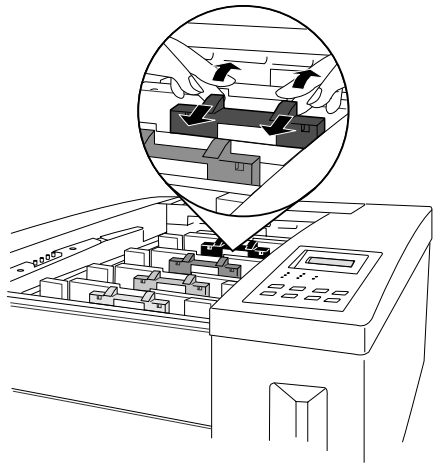

Fig. 6.2 *Release the Developer Cartridge*

6. Holding the developer cartridge by the green end-latches, gently lift it straight up and out of the printer, being careful not to spill any of the developer material. Then, discard the cartridge following safety laws and regulations.

WARNING! The developer is a highly combustible powder; never burn it. Also, avoid inhaling loose developer or getting it

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around your eyes; it can cause respiratory problems and eye irritation.

ACHTUNG! Bei dem Entwickler handelt es sich um ein gefährliches und leicht entzündliches Pulver; es darf deshalb niemals mit offenem Feuer in Berührung kommen. Einatmen oder Berührung mit Haut und Augen ist ebenfalls zu vermeiden, da dies zu Beeinträchtigungen der Atemwege, Haut- oder Augenreizungen führen könnte.

7. Remove the new developer cartridge from its protective bag.
8. Grasp the green latches at each end of the new developer cartridge and raise them straight up to open them.
9. Holding the new developer cartridge by the green latches, gently lower it into the empty slot until it is securely in place (fig. 2.7).
10. Close the cartridge latches by pushing them down (fig. 2.8).
11. Grasp the green tab attached to the top of the developer cartridge. Then, pull the tab and attached clear tape straight up and out of the cartridge, and discard it (fig. 2.9).
12. Replace the toner cartridge that you removed in step 2.
13. Replace the printer's top cover.
14. Clear the *x* DEV LOW message through the control panel using the Administration/Engine/Clear Warning menu. See chapter 4, "Printer Configuration," for details on using the control panel.

Replacing the OPC Belt Cartridge

This section covers replacing the OPC (Organic Photoconductor) belt cartridge in your printer. See "How Your Printer Works" in appendix D for details on what part the OPC belt plays in printing.

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A message on the control panel window, REPLACE BELT, indicates when it is time to change the OPC belt cartridge. This cartridge should be replaced every 50,000 planes or 12 months, whichever comes first. (A plane is a pass of the OPC belt for one color, so a one-color page makes one pass, a two-color page makes two passes, and so forth.) Changing the belt on a regular basis helps prevent the print quality from deteriorating.

NOTE: You may want to clean the paper guide and the register and paper exit rollers at this time also. They should be cleaned every 20,000 copies or 12 months, whichever comes first. The procedures for cleaning these parts are given later in this chapter.

Illustrations for many of the steps described in this section on replacing the OPC belt cartridge are in chapter 2, “Initial Printer Setup.”

To replace the OPC cartridge, use the following procedure:

1. Open the manual feed tray.
2. Lift the handle of the old OPC belt cartridge up to unlock it.
3. Pull the cartridge straight out of the printer, and discard it.

CAUTION: The OPC belt is extremely sensitive to bright lights and direct sunlight. Do not remove the new cartridge from its protective bag until you are ready to install it. Limit exposure to 800 lux (the average fluorescent lighting in an office) of light to under 2 minutes. If exposure exceeds this, put the belt in a dark place to recover; depending on exposure, recovery may take up to 2 hours.

Also, handle the belt cartridge carefully by either the two green side-handles or by the green end-handle. The belt is extremely

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sensitive to hand oils and scratches, both of which reduce print quality.

4. Remove the new OPC belt cartridge from its protective bag.

5. Remove the pressure release and tension release pin sets (one set on the left and one on the right) from the OPC belt cartridge by pulling them straight out (fig. 2.25).

   NOTE: These pins protect the belt and cleaning blade in the OPC belt cartridge by relieving tension during shipment or if the belt is out of the printer longer than a few hours.

6. Make sure the green end-handle on the cartridge is turned up (unlocked).

7. Slide the cartridge approximately three-quarters of the way into the printer until the notches on each side of the bottom rest on the lip of the manual feed tray (fig. 2.26).

8. Remove the black light-shield paper from the OPC belt by grasping the tab on the front and pulling the paper straight out of the printer (fig. 2.27).

9. Holding the cartridge by the green handle, firmly slide it the rest of the way into the printer until it snaps into place. It is in place when you can see the green arrows inside the metal frame of the printer.

10. Turn the green handle on the OPC belt cartridge down to lock the cartridge in place.

11. Close the manual feed tray.

12. Clear the REPLACE BELT status message through the control panel using the Administration/Engine/Clear Warning menu. See chapter 4, “Printer Configuration,” for details on using the control panel.

This completes the steps for replacing the OPC belt cartridge.

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Replacing the Cleaning Pad and Oil Bottle

This section covers replacing the cleaning pad and oil bottle in your printer. The cleaning pad removes printing debris (such as excess toner and paper dust) from the fusing unit. The oil helps prevent toner from sticking to the fuser rollers.

Replace the oil bottle and cleaning pad when `FUSER OIL LOW` or `OUT OF OIL` appears in the printer's message window. The first oil bottle and cleaning pad change is required at approximately 1,500 pages. After that, changes are required at approximately 3,000-page intervals. Changing these on a regular basis helps retain optimal print quality.

Illustrations for many of the steps described in this section are in chapter 2, "Initial Printer Setup."

To replace the cleaning pad and oil bottle

1. Turn off the main power switch on the back of the printer.
2. Remove the top cover (fig. 2.5).
3. Pull up on the paper exit unit latch and then tilt the unit back to open it (fig. 2.13).
4. Pull back the two latches (one on each side) of the separator pawl unit to unlock it; then tilt the pawl unit back towards the paper exit unit (fig. 2.14).

WARNING! The fuser unit can become extremely hot and cause severe burns. Make sure the unit is cool before handling it.

ACHTUNG! Die Fixiereinheit kann sehr heiß werden, so daß Verbrennungsgefahr besteht. Bitte lassen Sie die Fixiereinheit einige Zeit abkühlen, bevor Sie diese berühren.

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5. Locate the cleaning pad in the slot above the heat roller. Then, while carefully avoiding the surface of the fuser unit, which may be hot, grasp the pad by its center tab (towards the rear of the unit), pull it out of the printer, and discard it (fig. 6.3).

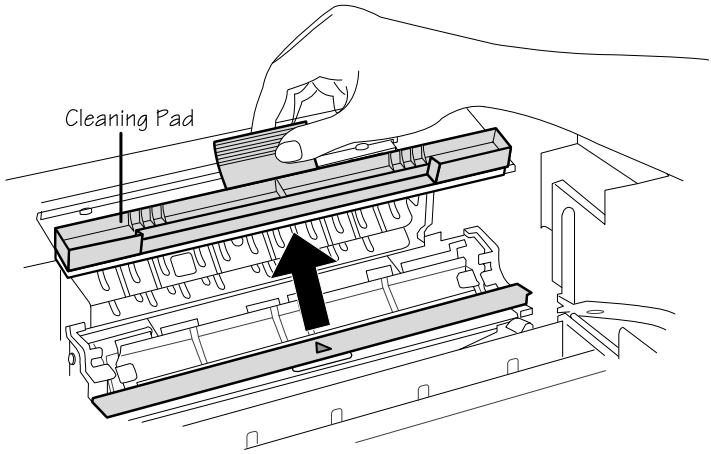

Fig. 6.3 *Remove the Cleaning Pad*

6. Remove the new cleaning pad and the new oil bottle from their protective bags.
7. Holding the new cleaning pad by its center tab (towards the rear of the unit), align the triangle mark on the pad with the one on the fusing unit (fig. 2.17).
8. Being careful to avoid any hot surface in the fuser unit, slide the new pad into the slot above the heat roller. The pad is correctly positioned when it is centered snugly in the slot.
9. Snap the separator pawl unit closed.
10. Pull open the spring latch on the outer edge of the oil bottle retainer, and lift the retainer up and toward the center of the printer (fig. 2.19).

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NOTE: Normally, a little oil remains in the fuser slot in which the oil bottle rests, and the spout of the oil bottle has a seal to prevent oil from spilling while you remove or install a bottle on the pin in the fuser slot. However, if oil accidentally spills beyond that slot, use a clean, dry, lint-free cloth or some cotton swabs to wipe up the excess.

11. Grasp the top tab on the oil bottle, then lift the bottle out of the printer, and discard it.

    NOTE: If you are replacing an oil bottle after a move, remove and discard the wadded paper towel from the place normally occupied by the oil bottle.

12. Hold the new oil bottle, spout end down, bottle label toward the front of the printer, over its slot in the fuser unit (fig. 2.19).

13. Lower the bottle into place, making sure the spout on the bottom aligns with the pin in the fuser slot. The bottle is positioned correctly when it fits snugly into the slot and is flush with the fuser unit.

14. Close and latch the oil bottle retainer.

15. Close the paper exit unit.

16. Replace the printer's top cover.

17. Turn on the main power switch.

Replacing the Waste Toner Pack

This section covers replacing the waste toner pack in your printer. The pack collects excess toner from the printing process and should be replaced when the window on the control panel displays the message `CHECK WASTE TONER`.

Illustrations for many of the steps described in this section are in chapter 2, "Initial Printer Setup."

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To replace the waste toner pack

1. Open the waste toner cover by pushing the cover on the top-right corner (fig. 2.22).
2. Remove the new waste toner pack from its protective bag and assemble it according to the instructions accompanying it.

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3. Gently tap the old waste toner pack on its side to settle the toner down into the pack (fig. 6.4).

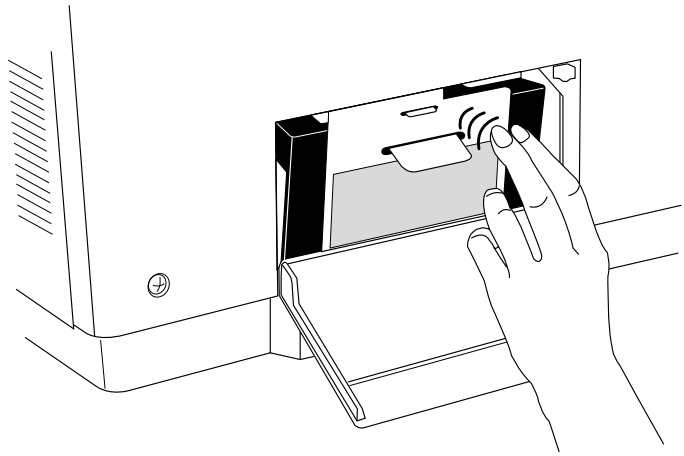

Fig. 6.4 *Tap the Waste Toner Pack*

WARNING! The toner is a highly combustible powder; never burn it. Also, avoid inhaling loose toner or getting it around your eyes; it can cause respiratory problems and eye irritation.

ACHTUNG! Bei dem Toner handelt es sich um ein gefährliches und leicht entzündliches Pulver; es darf deshalb niemals mit offenem Feuer in Berührung kommen. Einatmen oder Berührung mit Haut und Augen ist ebenfalls zu vermeiden, da dies zu Beeinträchtigungen der Atemwege, Haut- oder Augenreizungen führen könnte.

4. Grasp the tab on the top edge of the old waste toner pack, and pull it out of the printer.

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5. Place the old pack into the empty bag from the new waste toner pack and dispose of the old one following safety laws and regulations.

6. Holding the new waste toner pack by the side tab on the top, insert the pack into the printer until it fits securely. Then, lift up slightly on the tab to be sure the pack is level and centered (fig. 6.5).

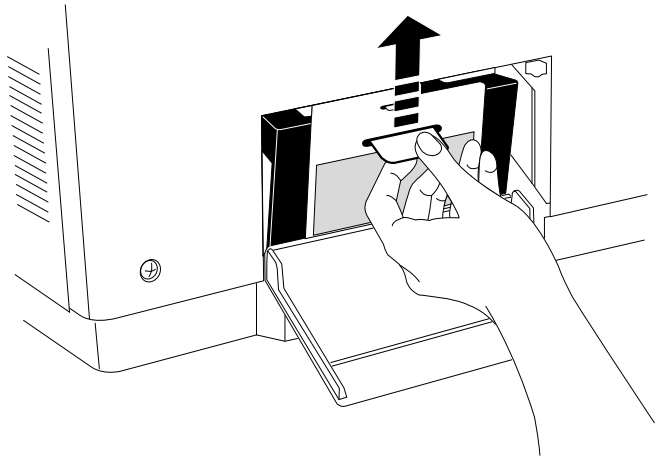

Fig. 6.5 *Lift up on Waste Toner Pack*

7. Close the waste toner cover.

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Moving the Printer

CAUTION: The printer is heavy: be sure you have help when moving it. Never lift it by the paper cassette slot, and always lift it by the four corners that have ridges for a safer, more secure grip. Be sure to close the manual tray.

If there's any chance the printer may not remain level or may be jostled during the move you need to do the following to protect the printer:

- Remove the toner and developer cartridges
- Remove the OPC belt cartridge and reinstall the pressure release and tension release pin sets in the cartridge
- Remove the fuser unit and the oil bottle and drain the oil from the unit.
- Replace the pressure-release pieces

See the sections on replacing the toner, developer, and OPC belt cartridges (earlier in this chapter) and the "Removing and Replacing Pressure-Release Pieces" section (later in this chapter) for details.

CAUTION: Make sure the OPC belt cartridge is protected while it is not in the printer. The belt is extremely sensitive to bright lights and direct sunlight. Limit exposure to 800 lux (the average fluorescent lighting in an office) of light to under 2 minutes. If exposure exceeds this, put the belt in a dark place to recover; depending on exposure, recovery may take up to 2 hours. Also, handle the OPC belt cartridge carefully by either the two green side-handles or by the green handle on the end. The belt is extremely sensitive to hand oils and scratches, both of which reduce print quality. When you

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must set it down, gently lay it on a clean, lint- and dirt-free surface, such as on fresh paper.

During the move, store the partially used toner and developer cartridges in their original shipping bags. If you do not have these bags, wrap the cartridges in pieces of sturdy cloth or plastic that cannot be harmed by loose residue. Carefully wrap the OPC belt cartridge in a piece of dark, heavy cloth and place it in a safe place where it will not get scratched or damaged.

Removing the Fuser Unit and Oil Bottle

Before you move the printer, you must remove the fuser unit and the oil bottle and drain the remaining oil from the oil tray. To do this

1. Turn off the main power switch on the back of the printer.
2. Remove the top cover (fig. 2.5).
3. Pull up on the paper exit unit latch and then tilt the unit back and down to open it.

WARNING! The fuser unit can become extremely hot and cause severe burns. Make sure the unit is cool before handling it.

ACHTUNG! Die Fixiereinheit kann sehr heiß werden, so daß Verbrennungsgefahr besteht. Bitte lassen Sie die Fixiereinheit einige Zeit abkühlen, bevor Sie diese berühren.

4. Pull open the spring latch on the outer edge of the oil-bottle retainer, and lift the retainer up and toward the center of the printer (fig. 2.19).
5. Grasp the top tab on the oil bottle, then lift the bottle out of the printer. The bottle may leak slightly, so place it in an

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oil-proof container, such as a plastic bag, until you are ready to reinstall it after the move.

NOTE: Normally, a little oil remains in the tray in which the oil bottle rests. If oil accidentally spills beyond this tray into the printer, use a clean, dry, lint-free cloth or some cotton swabs to wipe up the excess.

6. Close the oil bottle retainer.

7. Grasp the fuser unit by the two handles, one at each end (fig. 6.6), and lift it up and out of the printer.

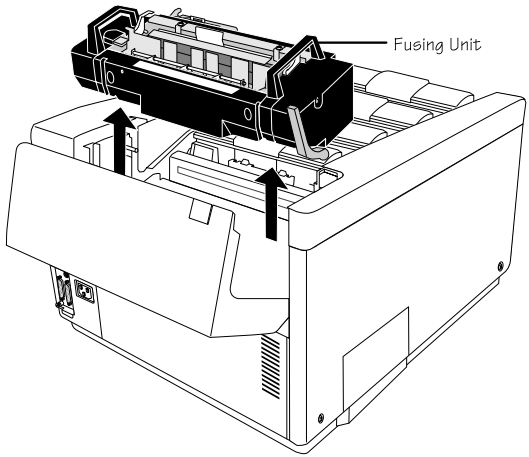

Fig. 6.6 *Remove the Fuser Unit*

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8. Align the fuser unit over an appropriate waste container, such as an old jar, and tilt the unit so the excess oil pours into the container (fig. 6.7). Then, dispose of the oil following safety laws and regulations.

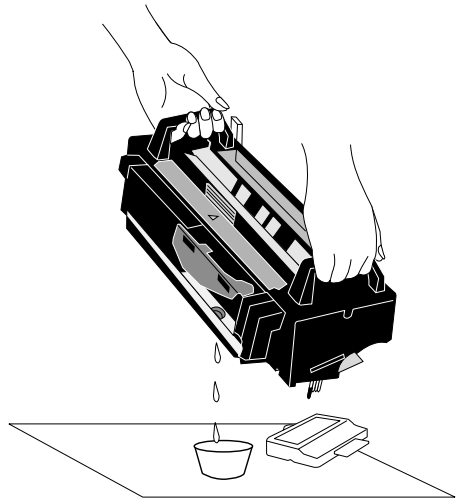

Fig. 6.7 *Drain Oil from Fuser Unit*

9. Use a clean, dry, lint-free cloth or some cotton swabs to wipe any remaining oil out of the tray.
10. Replace the fuser unit.
11. Stuff a clean, wadded paper towel into the place normally occupied by the oil bottle to act as a cushion and to absorb any residual oil during the move.
12. After the move, see “Replacing the Cleaning Pad and Oil Bottle,” earlier in this chapter, for instructions on reinstalling the oil bottle.

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Removing and Replacing Pressure-Release Pieces

The pressure-release pieces help relieve the tension on the fuser rollers to protect the roller from accidental damage during a move (or prolonged storage). They must be installed for the move and removed again before printing.

Illustrations of many of the steps described in this section are in "Removing the Pressure-Release Pieces" in chapter 2, "Initial Printer Setup."

Use the following procedure to remove and replace these pieces:

1. Open the paper exit unit by pulling up on the unit latch and then tilting the unit back and down (fig. 2.13).
2. Open the separator pawl unit by pulling back the two latches (one on each side) to unlock them and tilting the pawl unit back in the direction of the paper exit unit (fig. 2.14).
3. Open the pressure-release lever on the end of the fuser unit (fig. 2.15).

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CAUTION: If you are replacing the pressure-release pieces after the printer has been running, make sure the fuser unit has cooled. The fuser gets very hot and can damage these pieces.

4. If you are replacing the two pressure-release pieces (one at each end of the fuser roller), skip to step 5.

   If you are removing the pressure-release pieces, grasp the tab end of one of the pieces and gently pull it up and out of the printer (fig. 6.8). Remove the piece at the other end of the fuser roller in the same manner; then, skip to step 6.

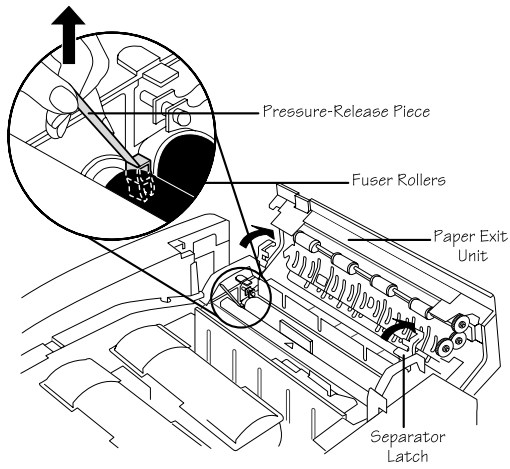

Fig. 6.8 *Remove the Pressure-Release Pieces*

WARNING! The fuser unit can become extremely hot and cause severe burns. Make sure the unit is cool before handling it.

ACHTUNG! Die Fixiereinheit kann sehr heiß werden, so daß Verbrennungsgefahr besteht. Bitte lassen Sie die Fixiereinheit einige Zeit abkühlen, bevor Sie diese berühren.

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CAUTION: If you are replacing the pressure-release pieces after the printer has been running, make sure the fuser unit has cooled. The fuser gets very hot and can damage these pieces.

5. If you are replacing the pressure-release pieces, hold one of the pieces down close to its base and firmly slide the base between the fuser rollers on one end (fig. 6.9). Then, repeat the process with the second pressure-release piece at the other end of the fuser rollers. When correctly positioned, the pieces fit snugly between the rollers.

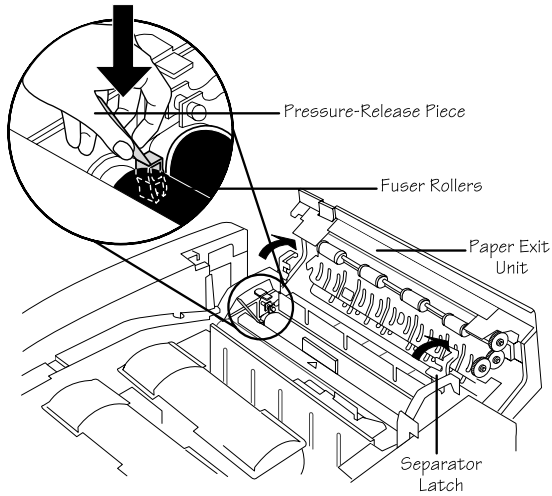

Fig. 6.9 *Replace the Pressure-Release Pieces*

6. Close the pressure-release lever on the end of the fuser unit.
7. Close the separator pawl unit.
8. Close the paper exit unit.

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Preventative Maintenance

Table 6.2, below, shows when preventative maintenance procedures (described in this chapter) should be performed:

Preventative Maintenance Schedule	
At this time...	**You should...**
Whenever print quality diminishes.	• Clean the Charger Unit. • Clean the Precharger Unit.
When you have printed 20,000 copies or 12 months have passed since the last cleaning (whichever comes first).	• Clean the Register and Transfer Rollers. • Clean the Paper Exit Rollers and Plates. • Clean the Paper-Feed Rollers and Manual-Feed Belts.
When a message mentioning a consumable appears in the control panel.	• Look up the message in chapter 9, "Troubleshooting," and take the action recommended.

WARNING! Remove the printer's power cord from the power outlet before cleaning or an injury may result.

ACHTUNG! Ziehen Sie den Netzstecker aus der Steckdose bevor Sie den Drucker reinigen.

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General Tips for Extending Printer Life

- Do not place anything on the top of the printer.
- Keep the output levels in the top cover at 150 sheets or less, depending upon the type of media.

  If media stacks too high, you may experience trouble with paper jams and excessive curl.
- If you are not going to use the printer for an extended period of time unplug the power cord from the power source outlet and close the manual feed tray.

Cleaning the Printer

When cleaning the printer, follow these guidelines:

- Read all caution and warning labels carefully, making sure to follow any instructions contained in them.
- Use a lint-free cloth dampened with a mild general cleaner on the exterior of the printer; do not use any organic solvent, such as thinner or benzene, as these can cause discoloration, alteration, spots on the transfer drum, or other problems.
- Use only lint-free paper towels, cloths, or swabs.
- After cleaning, allow all parts to dry before closing the printer, reattaching the power cord, and turning on the power switch.
- Make sure any parts removed during cleaning are replaced before reconnecting the power cord and turning on the printer.

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Cleaning the Charger Unit

Clean the charger unit whenever the print quality diminishes. To clean this unit you need several cotton cloths and swabs, and the wire cleaner located in the OPC belt tray (see figure 6.11 for location). To clean the charger unit

1. Open the manual feed tray by lightly pressing on the top-right corner (fig. 6.10), and then tilt the tray out and down.

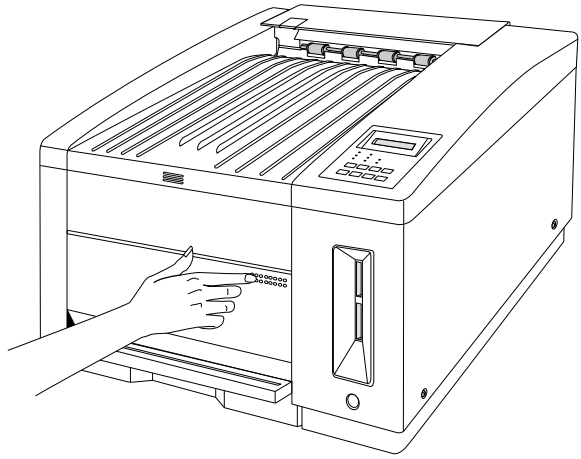

Fig. 6.10 *Open the Manual Feed Tray*

CAUTION: The OPC belt is extremely sensitive to bright lights and direct sunlight. Limit exposure to 800 lux (the average fluorescent lighting in an office) of light to under 2 minutes. If exposure exceeds this, put the belt in a dark place to recover; depending on exposure, recovery may take up to 2 hours.

Also, handle the OPC belt carefully, using either the two green side-handles or using the green end-handle when possible. It is

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extremely sensitive to hand oils and scratches both of which reduce print quality. When you must set it down, gently lay it on a clean, lint- and dirt-free surface, such as on fresh paper for the printer.

2. Lift the OPC belt cartridge handle up to unlock it, and pull the cartridge straight out of the printer (fig. 6.11).

3. Remove the wire cleaner from the cartridge (fig. 6.11).

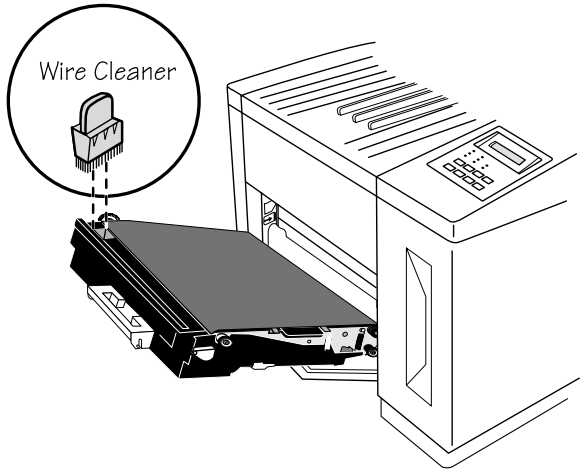

Fig. 6.11 *Remove the OPC Belt Cartridge*

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4. Holding the cartridge by its edges, fold the green end-handle back down and set the cartridge up on that end. The cartridge will tilt slightly to one side.

5. Locate the three brass-colored latches, which hold the charger unit in place. Then, swing each latch to the side to free the charger unit (fig. 6.12).

6. Grasp the green handle on the end of the charger unit and lift the unit out of the cartridge (fig. 6.12). Then, place the OPC belt cartridge in its protective bag or a dark area to protect it from light and set it aside until you are ready to reinstall it.

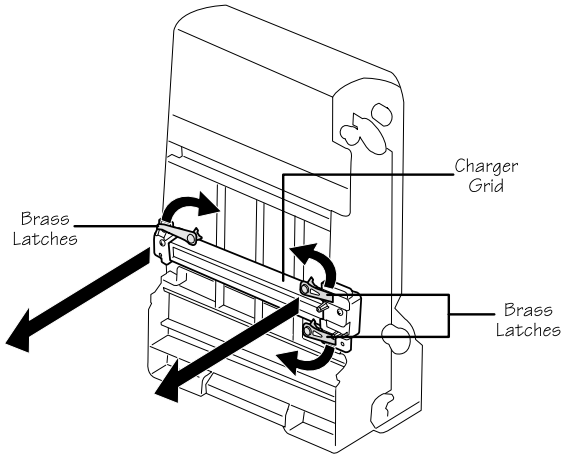

Fig. 6.12 *Open Charger Unit Brass Latches*

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7. Use clean, dry cotton cloths to gently wipe up any loose toner from the OPC belt cartridge area in the printer.

8. Clean the charger unit by sliding the wire cleaner along the groove in the top of the unit several times; then, flip the unit over and run the wire cleaner several times across the grid plate (a metal screen) on the bottom (fig. 6.13).

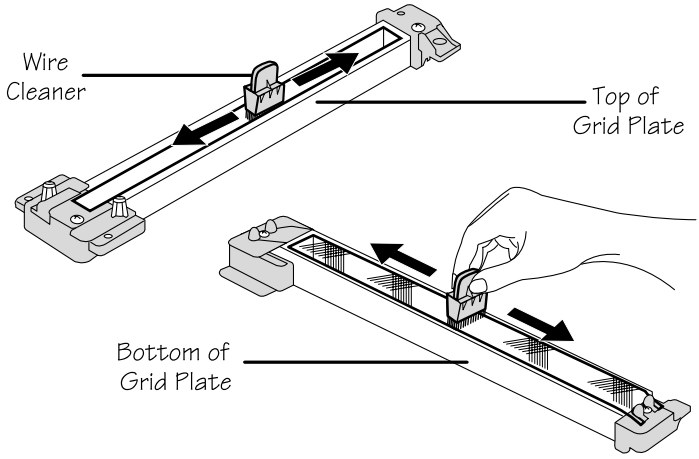

Fig. 6.13 *Clean the Charger Unit*

9. Turn the OPC belt cartridge up on the handle end again, and place the charger unit back into its slot.

10. Swing the three brass latches back over the charger unit to hold it in place.

11. Lift the OPC belt cartridge up and swing the green end-handle open.

12. Holding the cartridge by its handle, slide it back into the printer until it snaps in place. The cartridge is in place when you can see the green arrows inside the metal frame of the printer.

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13. Push the green end-handle down to lock the cartridge in place.
14. Close the manual feed tray.

Cleaning the Pre-Charger Unit

Clean the pre-charger unit whenever the print quality diminishes. To clean this unit you need several cotton cloths and swabs, and the wire cleaner located in the OPC belt tray (see figure 6.11 for location).

To clean the pre-charger unit

1. Remove the waste toner pack. (See "Replacing the Waste Toner Pack" in this chapter.) Then, set it aside on a surface that toner residue can't hurt, such as on a piece of paper.

WARNING! The toner is a highly combustible powder; never burn it. Also, avoid inhaling loose toner or getting it around your eyes; it can cause respiratory problems and eye irritation.

ACHTUNG! Bei dem Toner handelt es sich um ein gefährliches und leicht entzündliches Pulver; es darf deshalb niemals mit offenem Feuer in Berührung kommen. Einatmen oder Berührung mit Haut und Augen ist ebenfalls zu vermeiden, da dies zu Beeinträchtigungen der Atemwege, Hautoder Augenreizungen führen könnte.

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2. Grasp the end of the pre-charger unit, and pull it downward and then straight out of the printer (fig. 6.14).

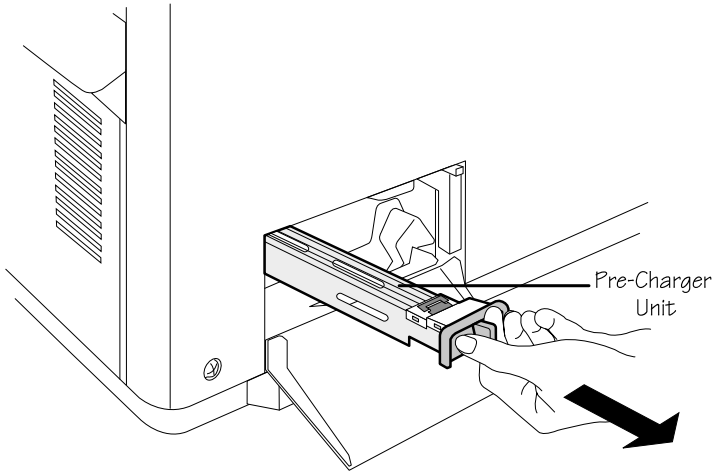

Fig. 6.14 *Remove the Pre-Charger from the Printer*

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3. Insert the wire cleaner into the recess on the pre-charger unit, and slide the cleaner back and forth as shown in figure 6.15.

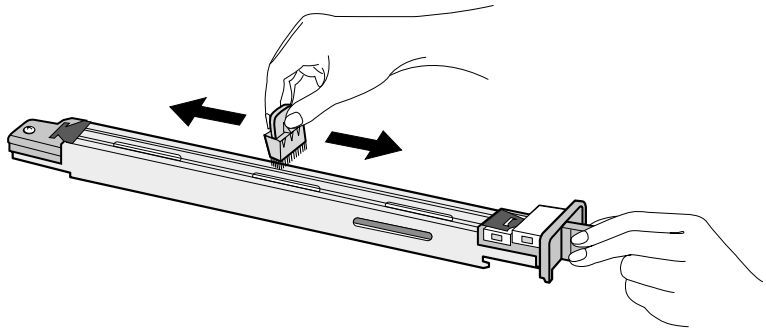

Fig. 6.15 *Clean the Pre-Charger Unit*

4. Clean the inside corners of the pre-charger unit with cotton swabs.
5. Making sure the pre-charger unit aligns on the runners inside the printer, slide it back into the printer.
6. Reinstall the waste toner pack, and close the waste toner cover.

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Cleaning Register and Transfer Rollers

Clean the metal and rubber register rollers and the transfer roller every 20,000 copies or 12 months, whichever comes first. This is roughly the same time schedule as replacing the OPC belt cartridge and cleaning the paper exit rollers, so you may want to do all of these procedures at the same time.

All you need for this procedure are 2 or 3 pieces of lint-free, cotton cloth. To clean the rollers

1. Open the back cover by pressing the top-right corner (fig. 6.16).

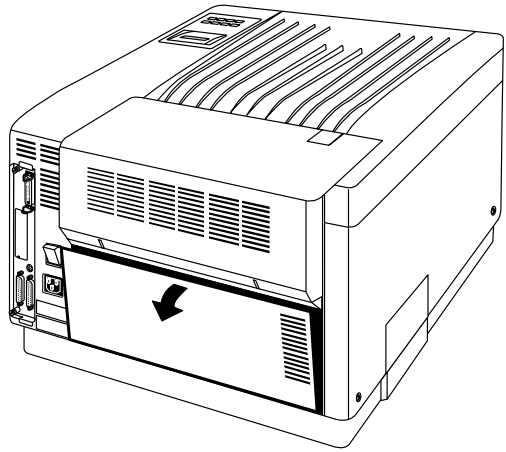

Fig. 6.16 *Open the Back Cover*

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2. Open the transfer unit by pulling the green latch handle in the center toward you and down (fig. 6.17).

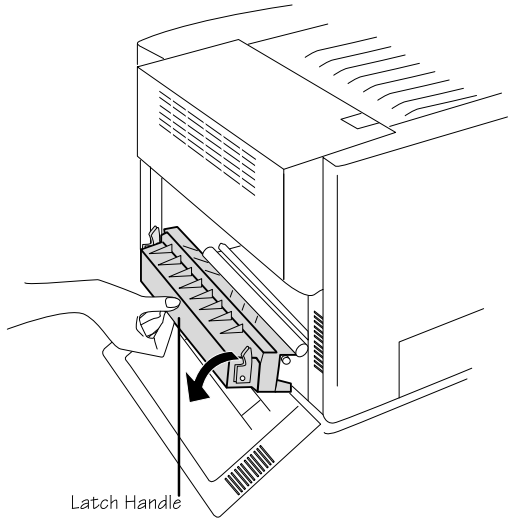

Fig. 6.17 *Open the Transfer Unit*

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3. Using dry cotton cloths, wipe the metal register roller in the transfer unit and the rubber register roller in the inner section of the printer. Then, wipe the transfer roller in the top section of the transfer unit (fig. 6.18). Rotate this roller to clean all sides with the cloth to remove paper dust, toner buildup, and other debris.

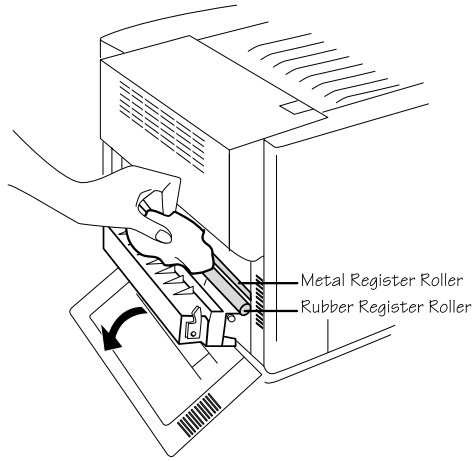

Fig. 6.18 *Clean the Register Rollers*

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4. Close the transfer unit (fig. 6.19).

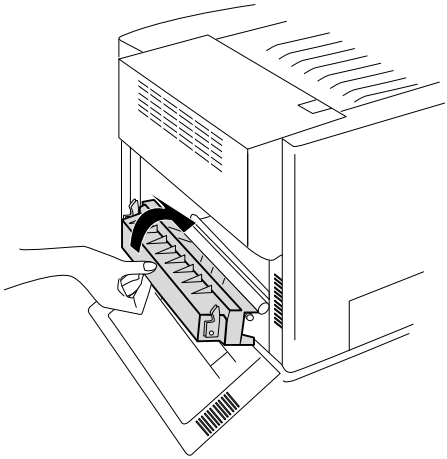

Fig. 6.19 *Close the Transfer Unit*

5. Close the back cover.

Cleaning the Paper Exit Rollers and Plates

Clean the paper rollers and plates every 20,000 copies or 12 months, whichever comes first. This is roughly the same time schedule as replacing the OPC belt cartridge and cleaning the register and transfer rollers, so you may want to do all of these procedures now too.

All you need for this procedure are 2 or 3 pieces of dry, lint-free, cotton cloth. To clean the paper exit roller

1. Open the paper exit unit (fig 2.13).
2. Use a dry, lint-free, cotton cloth and gentle pressure to clean the paper exit rollers and plates (fig. 6.20). Turn the coupling

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gear on the left end of the fuser unit to access all sides of the rollers.

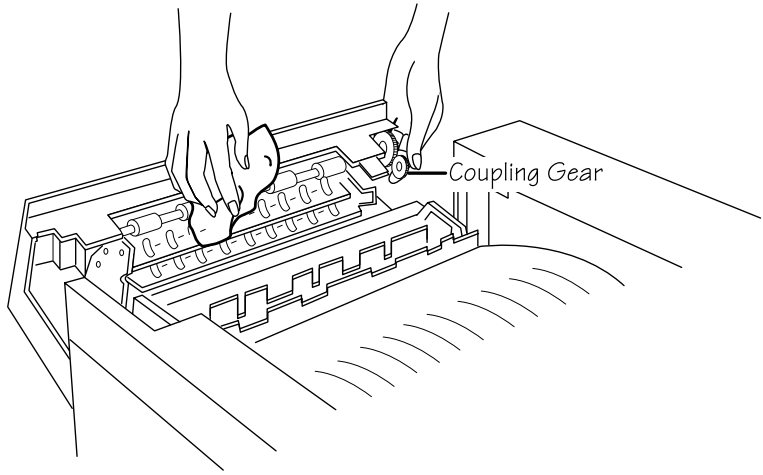

Fig. 6.20 *Clean the Fuser Exit Rollers*

3. Close the paper exit unit.

Cleaning the Paper-Feed Roller and the Manual-Feed Belts

Clean the paper-feed roller and the manual-feed belts every 20,000 copies or 12 months, whichever comes first, to prevent misfeeds and jams. This is roughly the same time schedule as replacing the OPC belt cartridge and cleaning the other rollers, so you may want to do all of these procedures at the same time.

You need a lint-free cotton cloth, lightly dampened with water, to perform this procedure. To clean the rollers

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1. Turn off the printer and remove the power cord and all interface cables.
2. Remove the media cassette.
3. Reach into the back of the cassette slot and locate the roller: it's on the top of the slot at the rear (fig. 6.21).
4. Use the damp cloth the wipe the roller. Rotate the roller so that the entire surface is cleaned.
5. Locate the manual-feed platform: it's a black plastic tray at the top of the cassette slot (fig. 6.21).

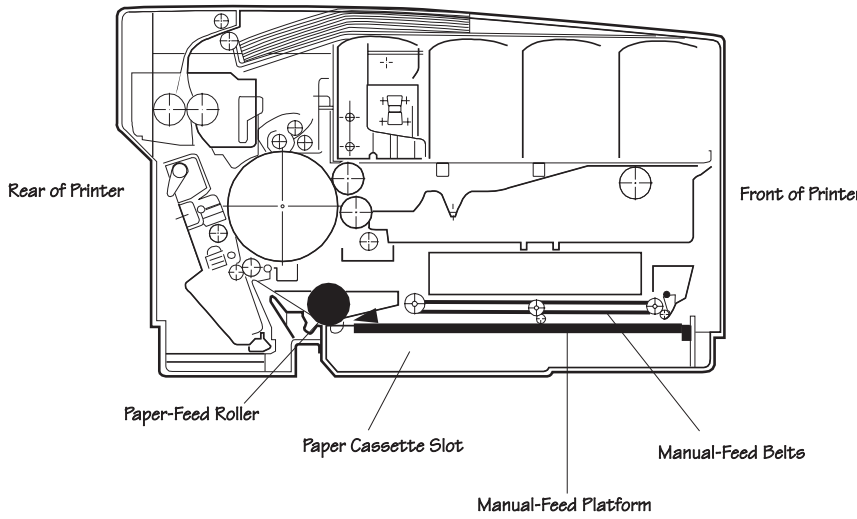

Fig. 6.21 *Locate the Manual-Feed Platform*

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6. Remove the manual-feed platform by lifting it up and forward at the front of the platform until it drops out (fig. 6.22).

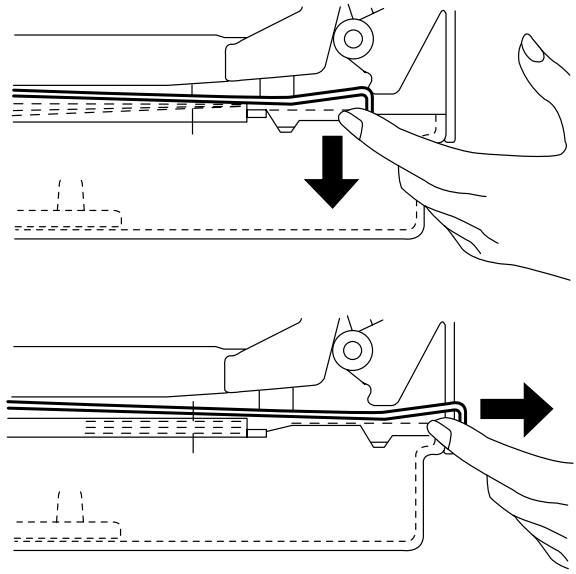

Fig. 6.22 *Remove the Manual-Feed Platform*

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7. Locate the two manual-feed belts at the top of the cassette slot (fig. 6.21).
8. Use the damp cloth the wipe the belts. Advance the belts so that the entire surface is cleaned.
9. Slide the manual-feed platform back into place. Push it back into the printer until it is secure.
10. If you have the optional 250-sheet feeder installed, repeat steps 2 through 4 for that cassette.
11. Replace the media cassette.
12. Replace the cables you removed in step 1 and replace the power cord.

Cleaning the Exterior of Your Printer

At times it may be necessary to clean the outside of your printer. Be sure read all of this section before cleaning your printer.

WARNING! Remove the printer's power cord from the power outlet before cleaning or an injury may result.

ACHTUNG! Ziehen Sie den Netzstecker aus der Steckdose bevor Sie den Drucker reinigen.

To protect your printer and to maintain its appearance, make sure you use the following guidelines:

- Use only mild household cleaning solutions that do not contain alcohol or solvents.
- Use only a dry or slightly damp, lint-free cloth. Never use sharp or rough implements, such as wire or plastic cleaning pads.

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- Always spray the cleaning solution on a cloth, not directly on the printer.
- Always test the solution on a small area of your printer to check the solution's performance.
- After cleaning, allow all parts to dry before closing the printer, reattaching the power cord, and turning on the power switch.

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Chapter 7

Optimizing Color Output

Chapter highlights:

- QCOLOR automatic color control
- Fine-tuning color output
- Color matching
- The resident fonts

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Introduction

This chapter offers hints for automatic color control and fine-tuning color output, discusses color matching, and lists the printer-resident fonts.

QCOLOR Automatic Color Control

As with any form of color reproduction, many variables can contribute to the final appearance of color laser prints. To take the guesswork out of optimizing color output, QMS developed QCOLOR, which dynamically configures the *magicolor* LX for the best output quality based on the contents of the document (text, line art, photographs, or scans) and the media it will be printed on. QCOLOR technology is accessed through our Windows or Macintosh driver.

Enabling QCOLOR for Windows

To use QCOLOR for Windows, first follow the instructions in "Installing the Windows 3.1 Driver" in chapter 3, "Connecting the Printer," if you haven't already. After the QMS Windows driver is installed, do the following to optimize color printing:

1. Open the PostScript Printer driver dialog box.

   You can do this from the Windows Control Panel by double-clicking the Printers icon and then choosing the Setup button. Also, you can get to the PostScript Printer driver dialog box from within most Windows applications—usually by choosing Print Setup from the File menu, and then choosing the Setup or the Options button. Check your application help or documentation for details.

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2. In the PostScript Printer dialog box, choose your printer (*magicolor* LX) in the Printers drop-down list.
3. Choose the Color Setup button.
4. In the Color Control Center dialog box, choose one of the following:

   - **Automatic Color Control** (if you're printing a combination of document types)

     Automatic Color Control is the best option for most jobs, because it's designed to provide the best color output for a large variety of documents. However, if for some reason the Automatic setting doesn't provide satisfactory color output for a particular page element or document type, then select a more specific QCOLOR setting (for example, Overhead for overhead transparencies or Photographic for scanned images).

   - **Graphics** (if you're printing color graphics)
   - **Grayscale** (if you're printing images with gray shades)
   - **Photographic** (if you're printing photographic images)
   - **Text and Spot Color** (if you're printing text or spot colors)
   - **Third-Party Color Management System (CMS)** (to allow your application to control color settings)
   - **Overhead** (if you're printing overhead transparencies)

     You can use any of the QCOLOR color setup options for transparency printing if you choose the Customize button and then select the Transparency option in the Color Setup dialog box (without changing any other options). If you do this, the Customize option will appear in the QCOLOR setup

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listbox when you return to the Color Control Center dialog box.

NOTE: The media tray you're using must be configured for the media type it contains. This can be done through the printer front panel (in the Operator Control/Media menu). See chapter 5, "Print Media and Daily Operations," for more information on media.

5. Choose OK.

NOTE: The settings chosen through Windows override settings chosen through the printer's front panel. Also, some applications (like Aldus PageMaker and Ventura Publisher) specify color outside the Windows driver, in which case the color settings in the Windows driver are ignored.

Because QCOLOR automatically adjusts the Halftone, CRD, Calibration, Gamma Correction, Dithering, Color Model, and Media Selection, these settings in the Color Setup dialog box do not have to be adjusted. To get more information about these and other options in the driver, choose the Help button, or see the "Fine-Tuning Color Output" section later in this chapter.

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Enabling QCOLOR for the Macintosh

To use QCOLOR for Macintosh applications, follow the instructions in "Installing LaserWriter 8.*x* and the *magicolor* LX 4.1 PPD" in chapter 3, "Connecting the Printer." After the QMS PPD is installed, do the following to optimize color printing:

1. In your application's Print dialog box, choose Options.
2. In the Options dialog box, in the QCOLOR Setup listbox, select one of the following options:

   - **Printer's Default** (to use the settings chosen at the printer front panel)
   - **Graphics** (if you're printing color graphics)
   - **Photographic** (if you're printing photographic images)
   - **Text and Spot Color** (if you're printing text or spot colors)
   - **Third-Party Color Management System (CMS)** (to allow your application to control color settings)
   - **Overhead** (if you're printing overhead transparencies)

     You can select any of the QCOLOR color setup options for transparency printing if you select Transparency from the Media listbox without changing any other options.

     NOTE: The media tray you're using must be configured for the media type it contains. This can be done through the printer front panel (in the Operator Control/Media menu). See chapter 5, "Print Media and Daily Operations," for more information on media.

3. Choose the Save button to save the QCOLOR settings between print jobs.
4. Choose OK.

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Because QCOLOR automatically adjusts the Halftone, Gamma Correction, CRD, and (for the Overhead setting) Media Type, these individual settings in the Options dialog box do not have to be adjusted, so they are grayed out when a QCOLOR option is chosen.

To be able to access individual settings such as Gamma Correction and CRD, then QCOLOR must be turned off (choose Printer's Default from the QCOLOR list box to turn off QCOLOR.) If you want information about the individual settings, see the "Fine-Tuning Color Output" section later in this chapter. To get more information about the standard LaserWriter options, choose the Help button in the driver window.

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Fine-Tuning Color Output

We've configured your printer so that most users don't have to change the default settings to get excellent color output, and we've provided QCOLOR technology (through the QMS-supplied Macintosh or Windows driver) to make it easy to automatically optimize color output. (See "QCOLOR Automatic Color Control," earlier in this chapter, for more information.) However, the printer is designed to allow you to change individual print-quality features if you wish to, or if your application requires you to use a non-QMS Macintosh or Windows driver.

This section gives more detailed information about the individual color settings available:

- Printer default halftone
- Dither pattern (not available in the Macintosh driver)
- Gamma correction
- Color rendering dictionary (CRD)

These settings can be changed in the printer configuration menu or in the QMS-supplied Macintosh or Windows driver. See chapter 3, "Connecting the Printer," for information on installing these drivers.

Printer Default Halftone Settings

Halftone settings, such as screen line frequency and screen angles, play an important part in the appearance of a color print. For example, incorrect halftone angles can cause prints to have a mottled appearance, called moiré.

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Screen frequency (also known as screen lines) is the number of halftone cells per inch. The higher the frequency, the higher the quality of the color print. Screen angles are the angles at which halftone screens are placed in relation to one another to avoid undesirable moiré patterns.

Although your application probably gives you the ability to fine-tune halftone settings, we have provided several printer default settings that we have found to optimize print quality for different printing tasks at different resolutions:

Enhanced Halftone

This halftone setting, which is the factory default setting, gives the best results for most jobs, providing fine detail, with no banding, rosettes, or moirés. The enhanced halftone has an effective line screen of up to 95 lpi (at 600 dpi) with 161 halftone gray levels, which allows the printer to produce up to 4.2 million colors. Choose this halftone setting in the following situations:

- If your jobs contain a mixture of text, graphics, and/or sampled images.
- If you are using the Pantone POCE or Apple ColorSync color management system, or if you are producing PANTONE®* simulations.
- For optimum color matching when using a printer-resident Color Rendering Dictionary.

* Pantone Inc.'s check-standard trademark for color reproduction and color reproduction materials.

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106 lpi x 45° Halftone

This is the best halftone setting for printing halftone (as opposed to spot color) graphics and text at 600 dpi resolution. We recommend that you select Gamma106 gamma correction when using this halftone (see "Gamma Correction," later in this chapter, for information).

71 lpi x 45° Halftone

This setting minimizes visible gradations (banding) at 600 dpi, but provides less detail than the 106 lpi x 45° halftone setting. We recommend that you select Gamma71 gamma correction when using this halftone (see "Gamma Correction," below, for information).

80 lpi x 45° Halftone

This halftone setting optimizes halftone (as opposed to spot color) graphics and text at 300 dpi resolution. We recommend that you select Gamma80 gamma correction when using this halftone (see "Gamma Correction," below, for information).

53 lpi x 45° Halftone

This setting minimizes visible gradations (banding) at 300 dpi but provides less detail than the 80 lpi x 45° halftone setting. We recommend that you select Gamma53 gamma correction when using this halftone (see "Gamma Correction," below, for information).

These halftone settings are available through the QMS-supplied Macintosh or Windows driver (see chapter 3, "Connecting the Printer," for installation instructions and see the driver help for more information), through the printer configuration menu

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(Administration/Emulations/PostScript/Default Halftone submenu), and through PS Executive Series Utilities (Color/Screen Angles menu).

To see the effect of the currently selected default halftone, print a Sample Page (from the Administration/Special Pages/Sample Page submenu in the printer's front panel or from PS Executive Series Utilities).

NOTE: A halftone selection made in an application or a driver overrides the printer default halftone setting.

Dither Pattern

NOTE: When using the Enhanced Halftone setting, the Dither option should be set to Standard.

Dithering refers to the way halftone dots are placed on the page. When printing halftones, increasing screen frequency results in finer detail, but decreases the number of dots per halftone cell, which decreases the number of colors that can be printed. With fewer colors available, color shifts are less smooth and banding can appear on prints.

To offset this effect, we've provided enhanced dithering settings to smooth color transitions and decrease the banding that can occur when using higher screen frequencies (lines per inch). In the Administration/Emulations/PostScript/Default Dither menu, you can choose from Standard, Enhanced Low, Enhanced Medium, and Enhanced High dithering. Standard, the factory default setting, is PostScript-compatible dithering. Enhanced dithering reduces the banding sometimes seen in PostScript-compatible dithering, with enhanced high producing the least banding.

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Gamma Correction

NOTE: When using the Enhanced Halftone setting, Gamma Correction should be set to None.

As with most other printer settings, gamma correction (which is a means of optimizing gray scales and shades of color) can probably be set through your application (see your application documentation for more information.) However, we provide a default gamma setting for each of the printer default halftone settings: Gamma53, Gamma71, Gamma80, and Gamma106. We also provide a None setting to turn off gamma correction.

Often in images, gray scaling or shades of color may be too light or dark to show details clearly. Using gamma correction on a gray-scale image is similar to using a graphic equalizer on a home stereo: the range of gray levels is adjusted for the best possible result. This sharpens overall midrange contrast while shadows and highlights keep their original values.

Printer-Resident Color Rendering Dictionaries

If you use the QMS-supplied Windows or Macintosh driver (or an application capable of PostScript Level 2 printing, such as Adobe PhotoShop), the printer-resident CRDs allow you to achieve device-independent color. Your printer comes with a Colorimetric CRD, a Business CRD, and a Photographic CRD.

Each CRD is provided in a 300 dpi and a 600 dpi version. Choose a 300 CRD setting (along with the Enhanced halftone) when printing in 300 dpi resolution. Choose a 600 CRD setting (along with the Enhanced halftone) when printing in 600 dpi resolution.

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The Colorimetric CRD

The Colorimetric CRD is designed for very basic color matching and one-to-one conversion from CIE color to CMYK color. With Colorimetric chosen as the printer default CRD, all colors are reproduced exactly unless a specified color is "out of gamut" (out of the printer's range). For out of gamut colors, the Colorimetric CRD substitutes the closest "in-gamut" color. The result is that exact color matches between the two devices are maintained wherever possible, but the printed image may have a smaller range of colors than the original image (since several image colors may be mapped to a single printer color). We recommend that you use this CRD for printing spot colors.

The Business CRD

The Business CRD matches the images on a monitor as closely as possible (WYSIWYG). Use the Business CRD for computer-generated graphics.

The Photographic CRD

QMS developed the Photographic CRD to optimize the quality of photographic images and other images with many subtle color shifts. Like the Colorimetric CRD, the Photographic CRD substitutes out-of-gamut colors with in-gamut colors, but it also adjusts (compresses) all other colors (whether in-gamut or out-of-gamut) as necessary to maintain the proportional relationship between the colors.

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Color Management

A major concern in the color publishing industry today is keeping color consistent across devices with different color models. For example, when you scan a color photograph, the scanner sends the image data to the computer in an RGB (Red-Blue-Green) format. The computer then converts the data into another RGB format to display it on the monitor. When the image data is sent to the printer, it is converted into CYMK (Cyan-Magenta-Yellow-blacK) format by the printer driver or application. Because of these conversions, a color output device (like your printer) may produce colors dramatically different from those seen on the computer screen, or in the original image.

To keep colors more consistent, you can use color management. Color management involves two processes: calibration and color matching.

Device Calibration

Calibration ensures that the hardware of a targeted device produces consistent color every time.

Color Matching

Even if you calibrate your color-generating devices, these devices still speak different color languages unless you have a color management system to translate between them. Color matching uses software to describe colors for different devices in a common language to make sure that color is produced in the same shade on all devices.

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There are currently three methods of color matching:

- Color management systems
- PostScript Level 2
- PANTONE®*Color matching.

Methods of Color Matching

Color Matching with a CMS

Color management systems (CMSs) work by translating color information from different devices into a common language. A CMS first gets information about the way these devices create color and the range of colors they can produce. (This information is contained in device *profiles*.) Then, using this information, the CMS maps each device's color descriptions to the CIE model, which is an international, device-independent standard for color.

For example, to make a printer's color output look the same as the colors on your computer monitor, a CMS translates the monitor's RGB colors into device-independent CIE color, and then translates from the CIE color into the printer's CMYK colors. A CMS can warn you (or automatically adjust color) when the colors you specify are outside the output device's range, and they can show you on screen how the printed output will look.

The advantages of using a CMS are that you get consistent color across all devices, and an on-screen preview of output. However,

* Pantone Inc.'s check-standard trademark for color reproduction and color reproduction materials.

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CMSs are not portable across platforms, they can be expensive, and they do consume processing time and power at the host.

A few well-known color management systems include Kodak ColorSense, Agfa FotoFlow, Electronics for Imaging EFIColor, Pantone POCE, and Apple ColorSync. The following are shipped with your printer:

- A ColorSync device profile
- A Pantone POCE CMM (Color Matching Method)
- A Pantone POCE device profile
- An ICC (International Color Consortium) device profile

  If this profile is not included with your printer, call QMS Customer Technical Assurance to check for availability.

Instructions for installation and use are included on the Pantone disk provided with the printer.

Color Matching with PostScript Level 2

Your printer's PostScript Level 2 capabilities allow it to accept device-independent CIE color specification directly (in addition to CMYK or RGB color specifications). This means that if you have an application that supports PostScript Level 2 printing (such as Adobe PhotoShop) or if you use the QMS-developed driver for Windows or Macintosh, your printer will perform color matching automatically. QMS drivers for Windows and Macintosh were shipped on disks with your printer: see chapter 3, "Connecting the Printer," of this manual for installation information. These drivers work with the printer-resident color rendering dictionaries to match colors. See "Printer-Resident Color Rendering Dictionaries" earlier in this chapter for more information on CRDs.

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The advantages of Level 2 color matching are that it is portable, it is application- and printer-resident (there's nothing else to buy), and it is performed at the printer level (so it doesn't tie up your host). However, no on-screen preview of output is provided, and you are not warned if a color is out of printer's gamut (color range).

PANTONE®* Color Matching

Your printer has been approved by Pantone Inc. to simulate PANTONE Colors. Pantone specifies hundreds of spot colors, each identified by a unique number. Each of these spot colors can be simulated on the printer with the appropriate combination of process (CMYK) colors.

Within a Pantone-licensed application (such as Aldus FreeHand or Adobe Illustrator), you can choose a PANTONE Color number and the corresponding CMYK simulation is printed. Pantone tables for supporting applications are shipped on a Pantone disk with the printer, including the following:

- Aldus FreeHand (Macintosh and Windows)
- Adobe Illustrator (Macintosh and Windows)
- QuarkXpress (Macintosh only)
- CorelDRAW (Windows only)

Instructions for installation and use are included on the Pantone disk provided with the printer. (If you did not receive a Pantone disk with your printer, call QMS Customer Technical Assurance.)

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If a particular application does not support PANTONE®*-identified colors, but does allow process color specification, the CMYK values may be entered directly to simulate PANTONE Colors. For this purpose, the following PANTONE Color look-up charts—containing four-color simulations of Pantone-identified colors and the percentage of each process color used to create them—are included with your printer:

- PANTONE.PS (for PCs)

  This a PostScript file containing a PANTONE Color look-up chart.

- Pantone Prism Demo (for Macintosh)

  This is a utility for printing out a PANTONE Color look-up chart.

- Pantone Professional Color Toolkit (for Macintosh)

  This an application that is required for Pantone support for QuarkXpress for the Macintosh, which also provides a PANTONE Color look-up chart.

Instructions for installation and use of these files are included on the Pantone disk shipped with your printer.

The formulas in the PANTONE Color look-up charts result in Pantone-approved color only under the following conditions:

- A Pantone-licensed application (such as Adobe Illustrator, QuarkXPress, and Aldus FreeHand) is used to create the color.

- The colors are printed with QMS-supplied toner.

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- The colors are printed on Hammermill Laser Print white paper.
- The printer's Administration/Emulations/PostScript/ Default Halftones option is set to Enhanced (if you have a *magicolor* LX with system software version 3.*x* or higher).

NOTE: The formulas listed in the Pantone charts are only for the *magicolor* LX printer. Also, the PANTONE®* Colors generated by this printer are four-color process simulations and may not exactly match Pantone-identified solid color standards. Use current PANTONE Color Reference Manuals (available from Pantone, Inc.) for accurate color.

The advantages of using PANTONE Color matching are that it is easy to use, it is widely supported, and that it is good for spot color. However, it is not as accurate as other methods of color matching, it can't be used for photographs, and it is only supported by applications.

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The Resident PostScript Fonts

This section lists the fonts resident in your printer. All of these fonts are authentic: they are licensed and carry the true name. See your QMS vendor if you are interested in obtaining more fonts.

Serif

ITC Bookman Light
ITC Bookman Light Italic
ITC Bookman Demibold
ITC Bookman Demibold Italic

Courier
Courier Oblique
Courier Bold
Courier Bold Oblique

New Century Schoolbook
New Century Schoolbook Italic
New Century Schoolbook Bold
New Century Schoolbook Bold Italic

Palatino
Palatino Italic
Palatino Bold
Palatino Bold Italic

Times Roman
Times Italic
Times Bold
Times Bold Italic

Sans Serif

ITC Avant Garde Book
ITC Avant Garde Book Oblique
ITC Avant Garde Demibold
ITC Avant Garde Demibold Oblique

Helvetica
Helvetica Oblique
Helvetica Bold
Helvetica Bold Oblique

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	Helvetica Condensed Helvetica Condensed Oblique Helvetica Condensed Bold Helvetica Condensed Bold Oblique
	Helvetica Narrow Helvetica Narrow Oblique Helvetica Narrow Bold Helvetica Narrow Bold Oblique
Script	ITC Zapf Chancery Medium Italic
Pi	Symbol ITC Zapf Dingbats

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The Resident HP PCL Fonts

The following typefaces are included with your printer for use with the HP PCL emulation. Courier 10 is 10 point, 12 pitch; Courier 12 is 12 point, 10 pitch. The Courier and Lineprinter fonts are bitmapped; the others are scalable. The default is Courier 12.

Courier 10 Medium
Courier 10 Bold
Courier 10 Italic Medium

Courier 12 Medium
Courier 12 Bold
Courier 12 Italic Medium

Line Printer Medium (8.5 point, 16.66 pitch)

Linotype Times Roman Medium
Linotype Times Roman Italic Medium
Linotype Times Roman Bold
Linotype Times Roman Italic Bold

Linotype Univers Medium
Linotype Univers Italic Medium
Linotype Univers Bold
Linotype Univers Italic Bold

Linotype Univers Condensed Medium
Linotype Univers Condensed Italic Medium
Linotype Univers Condensed Bold
Linotype Univers Condensed Italic Bold

ITC Zapf Dingbats Medium

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Chapter 8

Printer Options

Chapter highlights:

- Installing the optional sheet feeder
- Using an envelope cassette
- Using font and emulation cards
- Using a security card
- Installing Single In-line Memory Modules (SIMMs)
- Installing a direct network interface
- Converting the parallel port to Dataproducts
- Replacing the internal hard disk
- Internal and external hard disks
- Loading print system software

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Introduction

This chapter discusses installing printer options. If your QMS vendor cannot offer these options for your printer, see the "QMS World-wide Offices" section in appendix A, "QMS Customer Support," for telephone numbers to call for information.

The Sheet Feeder

The optional sheet feeder holds up to 250 sheets of media, which means less operator time spent refilling cassettes. It also provides printing flexibility; for example, you can load laser paper in the standard cassette and plain paper in the sheet feeder's cassette. Plus, this compact unit fits directly under the printer, so it requires no additional desktop space. Media and envelope cassettes are interchangeable between the printer and the optional sheet feeder.

Installing the Sheet Feeder

Unpack the sheet feeder and make sure you received the following:

- Sheet feeder unit
- Two small metal brackets
- Four large plastic corner brackets

NOTE: There may be several other pieces with the sheet feeder, but they are not required for this procedure.

WARNING! Your printer weighs approximately 106 lbs (48 kg) without consumables. Be sure to have help when lifting and moving it. If consumables are installed, be sure to keep the printer level when moving it to prevent accidental spills.

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ACHTUNG! **Das Gewicht dieses Druckers beträgt ohne Verbrauchsmaterial ca. 48 kg. Bitte versuchen Sie niemals, den Drucker alleine anzuheben oder zu transportieren. Achten Sie bitte darauf, daß der Drucker mit eingebauten Tonerkartuschen nur waagerecht transportiert wird.**

1. Turn the printer off, remove the power cord, and disconnect all interface cables from the printer.

2. With the help of another person, pick up the printer by the four corners and align it above the sheet feeder (fig. 8.1).

3. Keeping the printer level, lower it onto the sheet feeder (fig. 8.1). The bottom side edges of the printer rest inside the sides of the sheet feeder.

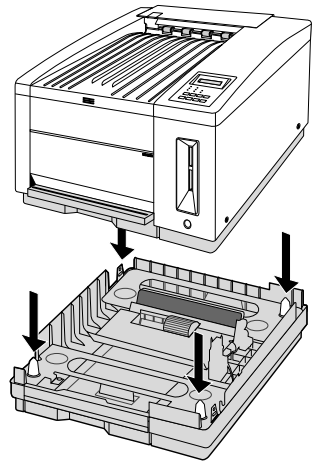

Fig. 8.1 *Lower Printer onto the Sheet Feeder*

4. Install the two small metal brackets using the following procedure:

   a. Align one of the metal brackets with the outside of the metal post on the front right side of the sheet feeder (fig. 8.2). Make sure

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the holes on the post and bracket are centered and that the flange on the bottom of the bracket goes into the slot on the post.

b. Attach the bracket to the post using one of the two small metal screws that came with the sheet feeder (fig. 8.2).

c. Align and attach the second metal bracket to the rear left sheet feeder post in the same way as you did the first bracket (fig. 8.2).

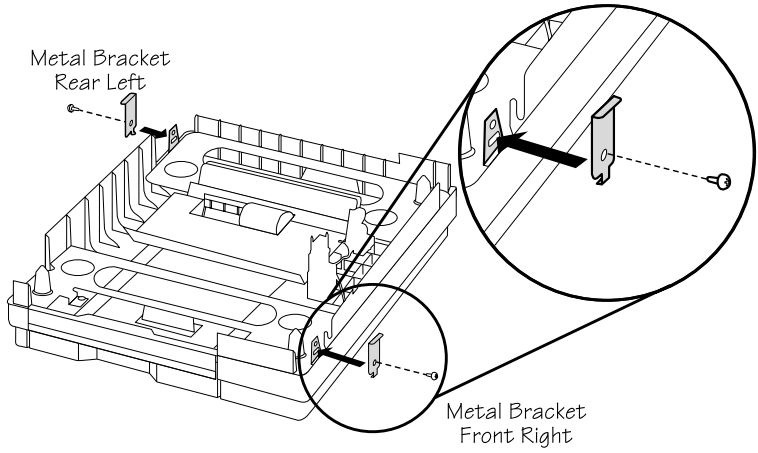

Fig. 8.2 *Install the Metal Brackets*

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5. Check the inside of the four plastic corner brackets. Each is labeled to indicate which corner of the sheet feeder it fits in.

6. Snap the plastic brackets onto the appropriate corners of the sheet feeder (fig. 8.3). These brackets have small rims on the bottom that fit inside the edges of the sheet feeder.

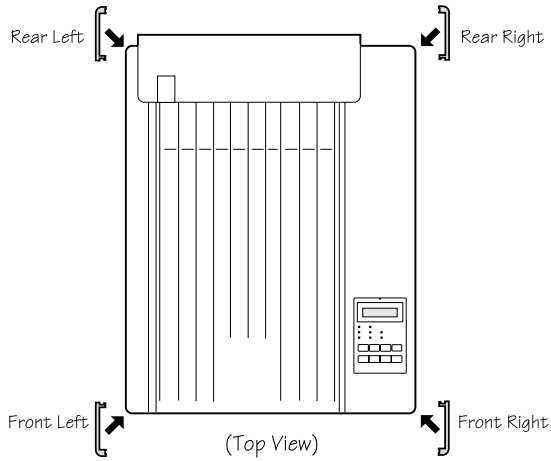

Fig. 8.3 *Attach the Corner Brackets*

The sheet feeder is now installed. See chapter 5, "Print Media and Daily Operations," for information on handling media and filling cassettes.

NOTE: If you move the printer with the sheet feeder attached, lift the unit by the four bottom corners, not by the sheet feeder's cassette slot. Before moving the printer, be sure to read "Moving the Printer" in chapter 6.

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Using the Envelope Cassette

You can purchase an envelope cassette from your QMS vendor. The envelope cassette holds up to 30 24-lb (90 g/m^2) DL and Com 10 envelopes. It fits in the slot for the standard or the optional media tray, but we recommend it be used in the standard slot. To use the envelope cassette

1. Remove the paper cassette from the printer (fig. 8.4).

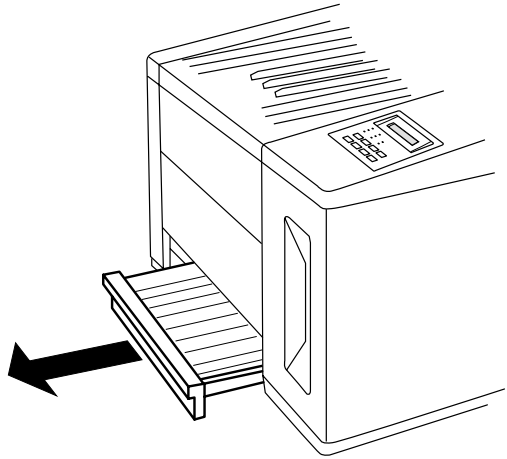

Fig. 8.4 *Remove the Paper Cassette*

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2. On the envelope cassette, set the back and side envelope stackers (figs. 8.5 and 8.6) to the correct envelope size.

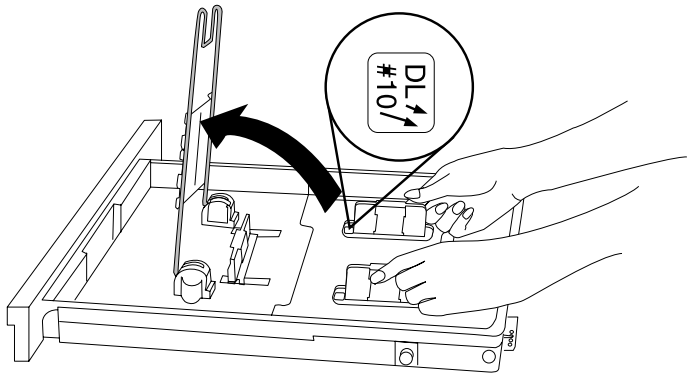

Fig. 8.5 *Set the side stackers*

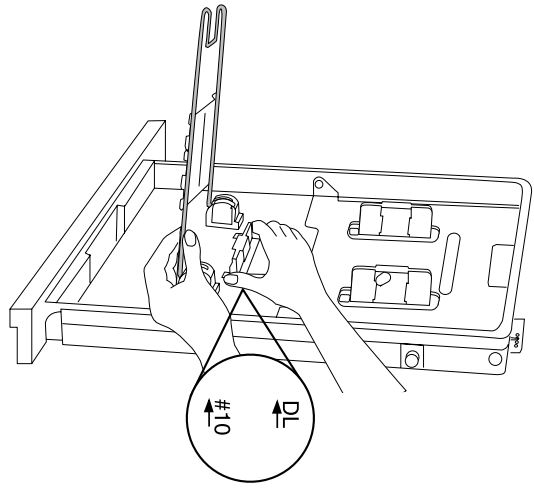

Fig. 8.6 *Set the rear stacker*

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3. Set the envelope-size key to the correct envelope size (fig. 8.7)

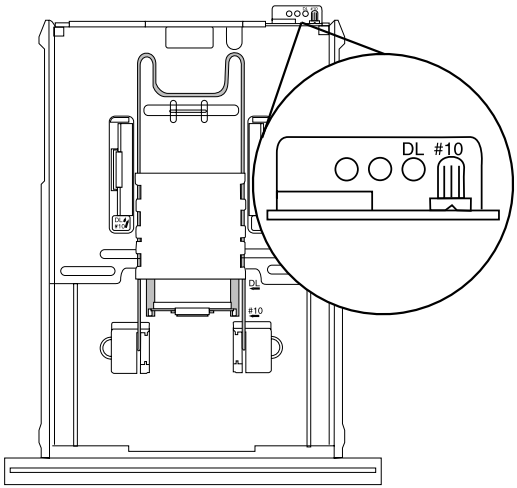

Fig. 8.7. *Set the size key*

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4. Lift the stacker arm and load 30 or fewer envelopes printing-side up, so that the flap side will be on the left when the envelope is pulled into the printer (fig. 8.8).

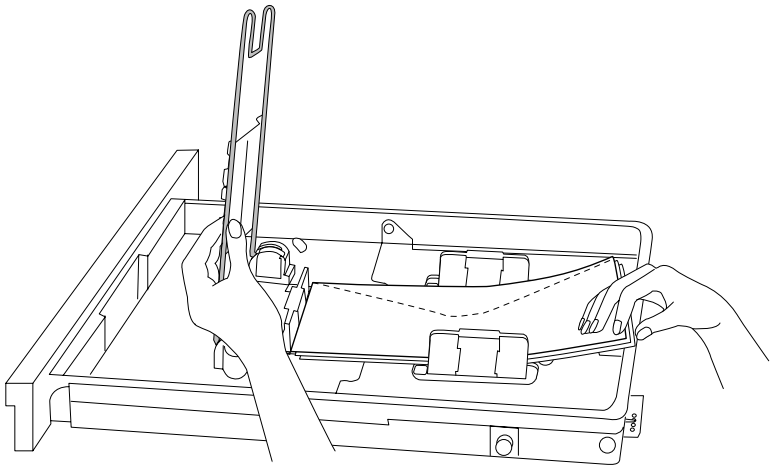

Fig. 8.8 *Load the envelopes*

5. Lower the stacker arm.

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6. Slide the envelope cassette into the printer (fig. 8.9).

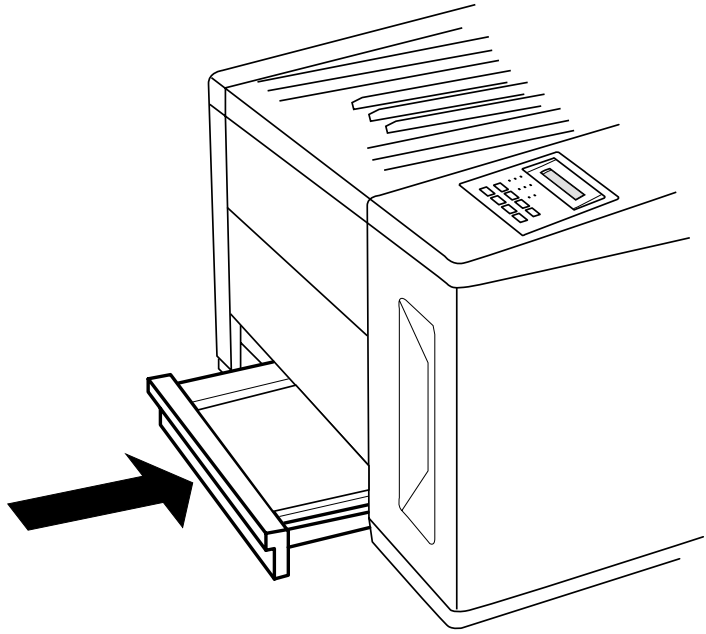

Fig. 8.9 *Slide the cassette into the printer*

7. Make sure you select the correct envelope size through your driver when printing.

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Font and Emulation Cards

You can purchase cards containing emulations or fonts not resident on the printer. The printer can support two cards at once, either two font cards or a font and an emulation card. Fonts and emulation cards may go in either of the two slots located on the front of the printer, below the control panel. For a complete list of currently available cards, contact your QMS vendor.

CAUTION: Usually, the printer must be off line before you insert or remove a card. Press the Online/Offline key to turn the LED off. If you forget to take the printer off line, turn the printer power off and back on to regain access to the printer's resident fonts and the data stored in the printer's memory.

However, before installing or removing the LN03 Plus or the ProCollection font card, you must turn off your printer rather than just take it off line. Then turn the printer back on after you finish.

Using Font and Emulation Cards

Use the following procedure to install a font or emulation card:

1. If you are installing an LN03 Plus or a ProCollection card, turn off the printer. Otherwise, press the Online/Offline key to take the printer off line (the LED should be off).

CAUTION: Font and emulation cards fit in only one direction, with the front label facing left, toward the center of the printer. Do not force them in backwards; this could damage the card and printer.

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2. Insert the card into either slot (fig. 8.10) with the front label side facing left toward the inside of the printer.

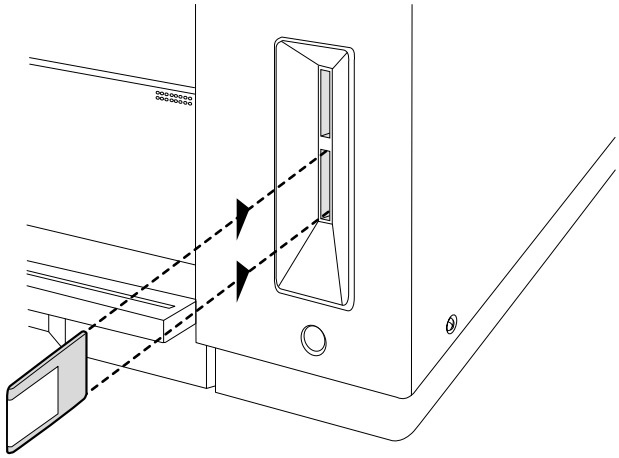

Fig. 8.10 *Insert the Font or Emulation Card*

3. Depending on the type of card you are installing, either turn the printer on again or put it back on line.

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To remove a card, use the following procedure:

1. If you are removing an LN03 Plus or a ProCollection card, turn off the printer. Otherwise, press the Online/Offline key to take the printer off line (the LED should be off).
2. Pull the card out gently.
3. Depending on the type of card you are removing, either turn the printer on again or put it back on line.

NOTE: If you are using an application, make sure the printer driver installed supports the fonts on the card, if you want to use those fonts. If not, contact your application manufacturer for support.

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Security Cards

An optional security card allows the Operator Control and Administration menus to be password protected, so that only users who know the password can change printer configurations. When a security card is installed, a new menu, Installation, appears in the printer's Configuration menu. The Installation menu is used to password-protect the printer.

CAUTION: The printer must be off line before you insert or remove a security card. If you forget to take the printer off line before you insert or remove a security card, turn the printer off and back on again to regain access to the data stored in the printer's memory.

Using a Security Card

A security card uses the same slots as font and emulation cards. The card slots are located on the front of the printer below the control panel. The following instructions explain how to use a security card:

1. Take the printer off line.

CAUTION: A security card fits in only one direction, with the front label facing left, toward the center of the printer. Do not force the card in backwards; this could damage the card and printer.

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2. Insert the security card into either slot with the card's front label facing left, toward the inside of the printer (fig. 8.11).

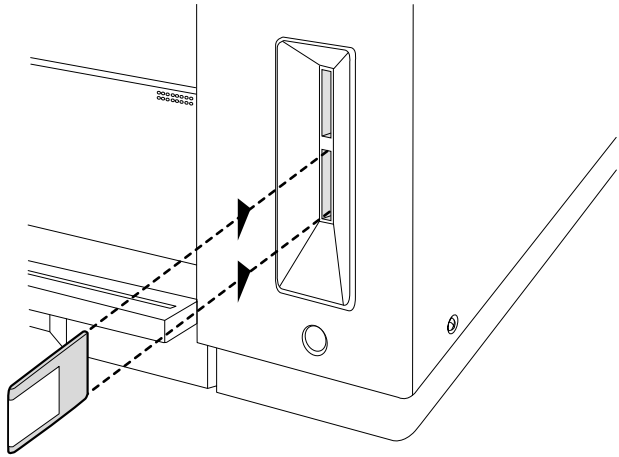

Fig. 8.11 *Insert the Security Card*

3. Press the Menu key to enter the Configuration menu. Press the Next key until the following message displays in the control panel message window:

```
CONFIGURATION
INSTALLATION
```


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4. Press the Select key to enter the Installation menu, then use the Next key to view the menu options:

```
OPERATOR PASSWRD
USE OPERATOR PWD
ADMIN PASSWORD
USE ADMIN PWD
```

5. To password-protect the Operator Control menu, press Select to display the message

```
INSTALLATION
OPERATOR PASSWRD
```

   Then, specify the password. (See the section "Entering Alphanumeric Values" in chapter 4, "Printer Configuration," for detailed instructions for entering alphanumeric values.)

6. When you have entered the complete password, press the Select key. This saves the password and returns you to the Installation menu.

7. To turn on the Password option, press the Next key to display the message

```
INSTALLATION
USE OPERATOR PWD
```

8. Press the Select key to enter this submenu. Then press the Next key to display the message

```
USE OPERATOR PWD
YES
```

9. Press the Select key. This activates the password option and returns you to the Installation menu.

10. To password-protect the Administration menu, press the Next key to display

```
INSTALLATION
ADMIN PASSWORD
```


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11. Press Select, then specify the password. (See the section "Entering Alphanumeric Values" in chapter 4, "Printer Configuration," for detailed instructions for entering alphanumeric values.)

12. When you have entered the complete password, press the Select key. This saves the password and returns you to the Installation menu.

13. To turn on the Password option, press the Next key to display the message

```
INSTALLATION
USE ADMIN PWD
```

14. Press Select to enter this submenu. Press the Next key to display

```
USE ADMIN PWD
YES
```

15. Press Select. This returns you to the Installation menu.

16. Once the passwords are entered and activated, press the Menu key to return to the Main menu. The following message is displayed:

```
SAVE CHANGES?
*NO
```

17. Press the Next key to display

```
SAVE CHANGES?
YES
```

18. Press Select. Remove the security card from the card slot, and put the printer back on line.

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Once a menu is password-protected, you cannot enter it or make changes in it until you enter a valid password. You know a menu is password protected if

```
ENTER PASSWORD
```

appears on the message window when you try to enter the Configuration menu. If you enter an invalid password, the message window flashes

```
INVALID PASSWORD
```

for three seconds, and then returns to the parent menu. If you forget the password, the system administrator can easily recover it by repeating the “Using a Security Card” procedure.

If you enter the correct password, you are allowed to enter the menu. The password for the two menus may be the same or different.

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Removing the Controller Board

The first step in installing many printer options is removing the printer's controller board.

The following instructions for removing the controller board are written for advanced users. Do not attempt this procedure if you have no experience working with circuit boards.

CAUTION: It's very important to protect the printer controller board from electrostatic damage while performing this task.

If an anti-static wrist strap is provided in your printer option kit, attach one end of it to your wrist and the other end to any convenient electrical ground (for example, the bare metal chassis of equipment, as on the back of a computer, that is plugged in but turned off). Never attach the wrist strap to any piece of equipment with an electrical current present. Turn off all power switches first. Plastic, rubber, wood, painted metal surfaces, and telephones are not acceptable grounding points. The printer isn't an acceptable grounding point either because it must be unplugged before you perform this task.

If you don't have an anti-static wrist strap, discharge your body's static electric charge by touching a grounded surface before you handle any printer boards or components and before removing the tray assembly cover. Redischarge your body each time after walking around and before touching the printer tray assembly again. Handle the tray carefully, and try to handle it by the edges only.

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1. Turn the printer off and remove the power cord. Disconnect all interface cables from the printer.
2. Position the printer so that the back is facing you.
3. Using a screwdriver, loosen the two mounting screws that hold the controller board to the printer (fig. 8.12).
4. Grasping the board by the top and bottom metal rims, gently pull the controller board straight out and lay it on a flat surface (fig. 8.12).

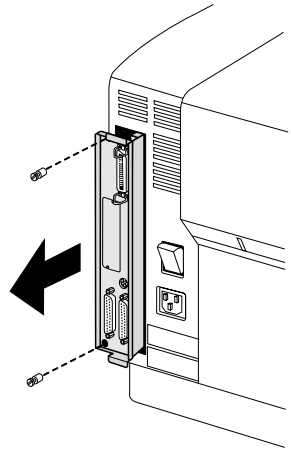

Fig. 8.12 *Remove the Mounting Screws*

5. Install your printer option and then refer to the following section, “Replacing the Controller Board.”

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Replacing the Controller Board

This section explain how to replace the controller board after installing a printer option.

The following instructions are written for advanced users. Do not attempt this procedure if you have no experience working with circuit boards.

CAUTION: It's very important to protect the printer controller board from electrostatic damage while performing this task.

If an anti-static wrist strap is provided in your printer option kit, attach one end of it to your wrist and the other end to any convenient electrical ground (for example, the bare metal chassis of equipment, as on the back of a computer, that is plugged in but turned off). Never attach the wrist strap to any piece of equipment with an electrical current present. Turn off all power switches first. Plastic, rubber, wood, painted metal surfaces, and telephones are not acceptable grounding points. The printer isn't an acceptable grounding point either because it must be unplugged before you perform this task.

If you don't have an anti-static wrist strap, discharge your body's static electric charge by touching a grounded surface before you handle any printer boards or components and before removing the tray assembly cover. Redischarge your body each time after walking around and before touching the printer tray assembly again. Handle the tray carefully, and try to handle it by the edges only.

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1. Using both hands, carefully reinsert the controller board (fig. 8.13) making sure the controller board is properly seated in its connectors.
2. Retighten the two mounting screws you loosened previously (fig. 8.13).

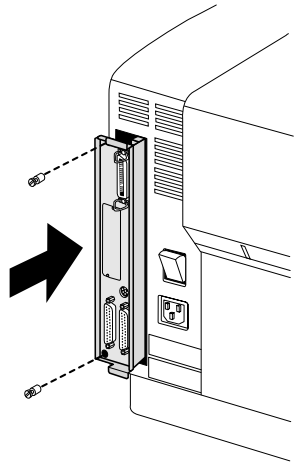

Fig. 8.13 *Reinstall the Controller Board*

3. Reconnect all interface cables and the power cord, and then turn on the printer.

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Single In-Line Memory Modules (SIMMs)

Additional printer memory allows you to increase data transfer and processing speed. To install SIMMs,

1. Follow the instructions in "Removing the Controller Board" (earlier in this chapter), being careful to discharge electrostatic buildup before you begin.
2. Turn the controller board so that the side where the SIMMs are located is closest to you and the SIMMs are located on your right side.
3. If there are enough open connectors for the additional SIMMs you are installing, skip to step 6. However, if you need to remove existing SIMMs to make space for new ones, follow the instructions in steps 4 and 5.
4. If you need to remove a SIMM to make room for larger-memory SIMMs: Use the clips located on each side of the connector to gently release the SIMM.

CAUTION: If you are removing SIMMs, remember that printer operation requires at least 12 MB of total memory, with at least 4 MB of that memory in the slot closest to the center of the board.

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5. Tilt the SIMM back to a 45° angle and slide it up and out of the connector (fig. 8.14).

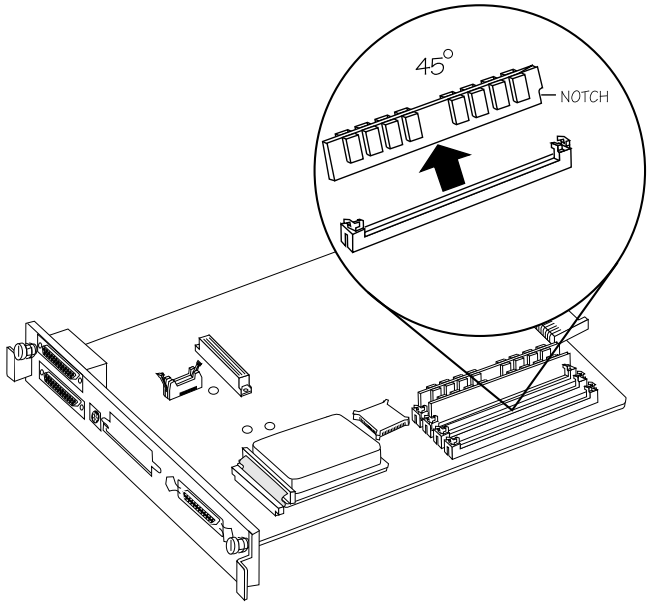

Fig. 8.14 *Tilt the SIMM Back and Remove It*

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6. Remove the new SIMM from the anti-static bag.

7. Hold the new SIMM at a 45° angle, with the notch on the right-hand side (fig. 8.15). Insert the bottom edge of the new SIMM into an open connector.

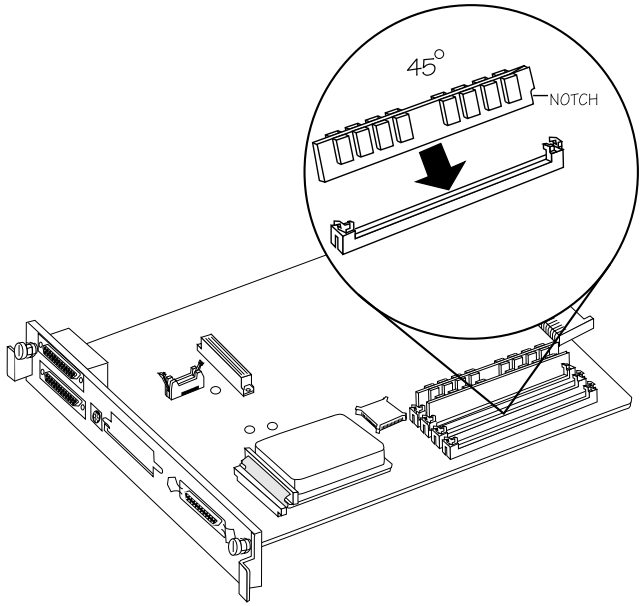

Fig. 8.15 *Insert the SIMM into the Connector*

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8. Gently pull the SIMM forward to a 90° angle until you feel it fit into place (fig. 8.16) behind the clips on either side of the connector. (You may need to use your fingers to open these clips.) When seated, the SIMM stands upright, firmly in place.

CAUTION: If you cannot easily fit the SIMM into place, **do not force it**. Reposition it, making sure that the bottom of the SIMM is seated completely in the connector. If there's not enough room between SIMMs to properly tilt and insert the new ones, first remove all the SIMMs, install the new ones, then re-install the old ones. Steps 4 and 5, above, explain how to remove SIMMs.

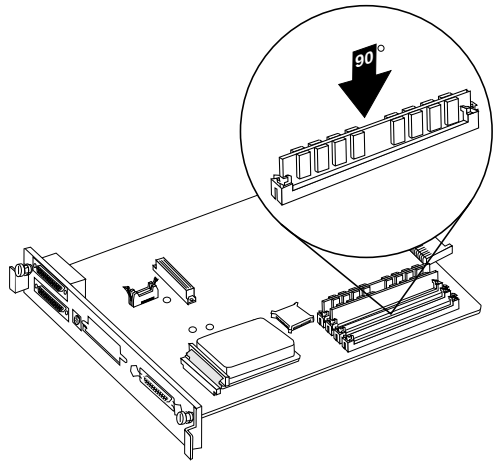

Fig. 8.16 *Pull the SIMM Forward into Position*

9. Follow the instructions in "Replacing the Controller Board" (earlier in this chapter), being careful to follow the directions for eliminating electrostatic buildup.

NOTE: You may want to print out an advanced status page (Administration/Special Pages submenu) so you have a

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record of your changes before you go to the next step. See chapter 4, “Printer Configuration,” for information on using the configuration menu.

10. In the printer configuration menu, use the Administration/ Miscellaneous/Restore Defaults option to make the printer recognize the additional memory.

The Administration/Memory section in chapter 4, “Printer Configuration,” and Appendix D, “Additional Technical Information,” contain information about printer memory.

Installing a Network Interface

This section describes how to install a network interface.

NOTE: The QMS *magicolor* LX printer is compatible only *magicolor* LX network interfaces. If a non-*magicolor* LX interface is installed, the following error message appears on the start-up page: “Incompatible network option installed.” Also, depending on which type of interface you are installing, the interface card in the illustrations accompanying these instructions may look slightly different from your interface card, but the installation procedure is the same.

Make sure you have all the parts necessary for the interface installation. The network interface kit includes the following:

- An anti-static wristband
- A network interface card and two plastic support posts
- A daughterboard and two plastic support posts

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- An external power supply box (not needed for all interfaces)
- An interface plate

Your kit may contain additional parts not required for network interface installation on this particular printer.

1. Follow the instructions in “Removing the Controller Board” (earlier in this chapter), being careful to eliminate electrostatic buildup before you begin.

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2. Using a Phillips screwdriver, remove the two screws from the blank optional I/O plate, and then remove the plate from the interface panel and set it aside (fig. 8.17).

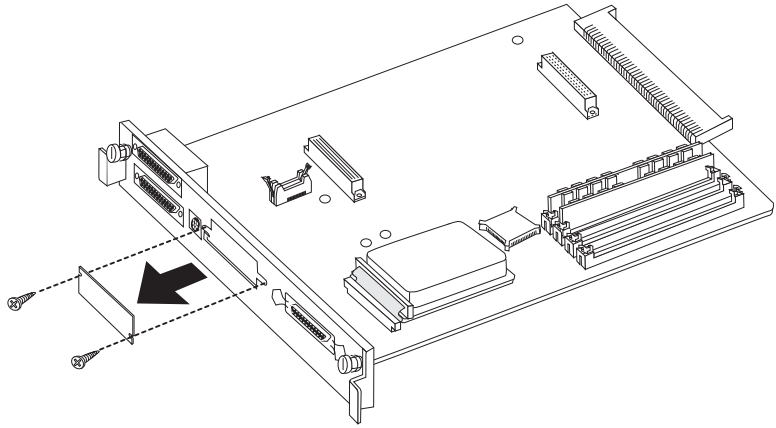

Fig. 8.17 *Remove the Optional I/O Plate*

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3. Examine the ends of the two plastic support posts that come with the smaller network interface card: one end has a slightly larger diameter and the other end is slightly more tapered. Insert the larger ends into the controller board (fig. 8.18).

4. Snap the network interface card onto the plastic support posts (fig. 8.18). (If you have trouble snapping the interface board onto the support posts, you probably inserted the wrong ends of the posts into the controller board in step 3.)

5. Using the two screws you removed in step 2, fasten the new interface plate to network interface card to hold the card in place (fig. 8.18).

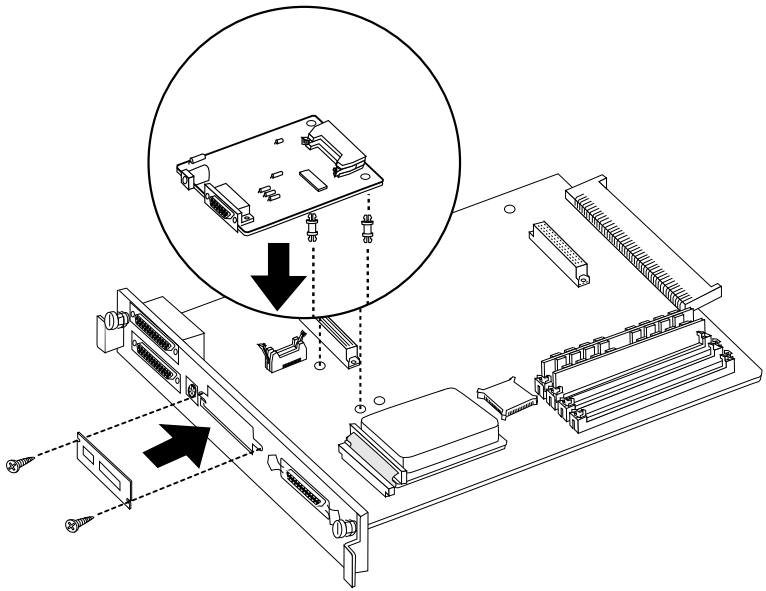

Fig. 8.18 *Attach Support Posts to Controller Board*

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6. Hold the plastic ribbon cable so that the notch (key) on one end faces upward and slide it onto the interface card connector (fig. 8.19). Fold the plastic ribbon cable over so that the notch (key) on the other end is facing to the right and slide it into the controller board connector to the left of the network interface card. (You may have to open the ejector latches on the connectors to be able to connect the ribbon cable.)

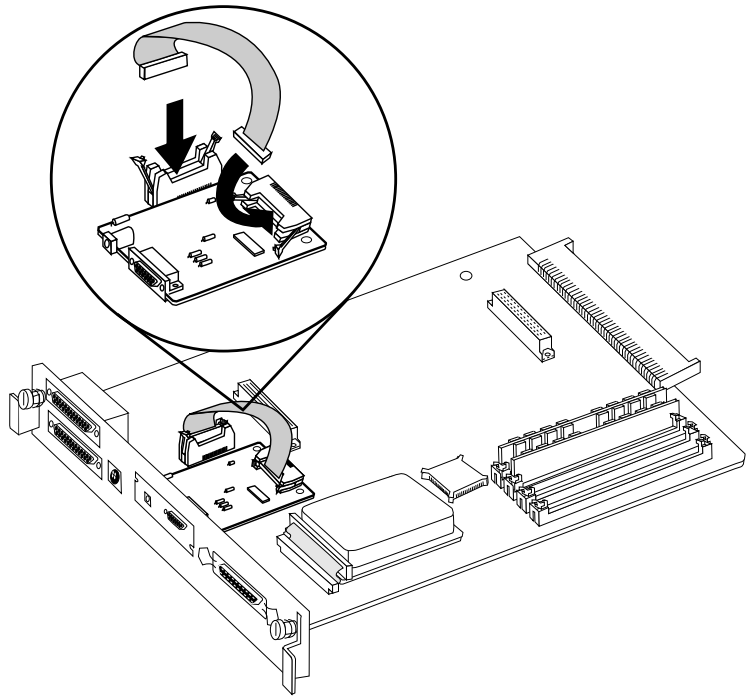

Fig. 8.19 *Connect Both Ends of the Cable*

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7. Examine the ends of the two plastic support posts that come with the daughterboard: one end has a slightly larger diameter and the other end is slightly more tapered. Insert the larger ends into the controller board.

8. Attach the daughterboard to the two support posts and the two 48-pin connectors (fig. 8.20). (The daughterboard is keyed so that it fits only one way.)

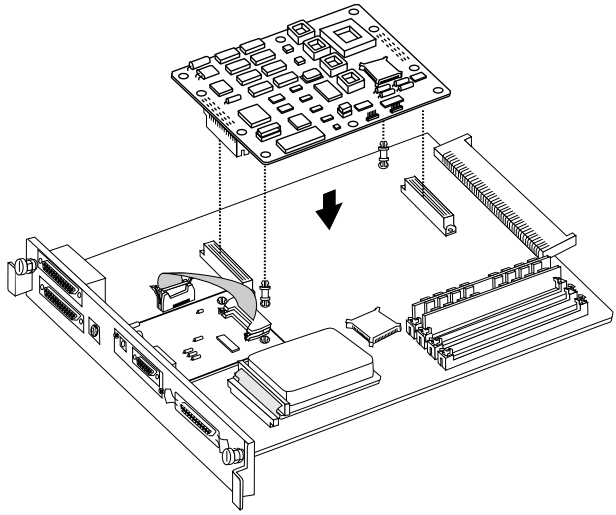

Fig. 8.20 *Attach the Daughterboard to Support Posts*

9. Follow the instructions in "Replacing the Controller Board" (earlier in this chapter), being careful to eliminate static electricity.

10. If your interface kit came with an external power supply box, attach it to the round connector next to the network interface port; then connect the box to a power cord and plug the power cord into an electrical outlet.

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Using an Optional Network Interface

After you have correctly installed an optional network interface, refer to the following for more information:

- The "Administration/Communications/Serial" section of chapter 4, "Printer Configuration," contains information about the PS Protocol option in the new optional network interface submenu that appears in the Administration/ Communications menu.
- The manual that comes with the optional network interface contains information about all other options in the new network interface submenu, as well as instructions for connecting the printer to the network and for printing over the network.
- Your network documentation also contains information on printing over the network.

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Centronics to Dataproducts Conversion

Your printer is shipped with a Centronics parallel port, but a kit for converting it to Dataproducts is available from your QMS vendor.

Make sure you have all the parts necessary for the conversion. The Dataproducts conversion kit includes the following:

- An anti-static wristband
- Two 2-pin shunts (small plastic pieces lined with metal)
- Two DIP resistors (a 220 ohm and a 330 ohm)
- Two SIP resistors (not necessary for this procedure)
- A 50-pin to 36-pin cable

1. Follow the instructions in “Removing the Controller Board” (earlier in this chapter), being careful to eliminate static electricity before you begin.
2. Orient the controller board so that the side with the SIMMs is closest to you and the parallel port is located on your left side.

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3. If you don't have an network interface board installed, skip to step 4. If you do have an network interface board installed, follow the instructions below for removing it:

   a. Using a Phillips screwdriver, remove the two screws from the interface plate (fig. 8.21).

   b. Detach the plastic ribbon cable from the interface card.

   c. Remove the network interface card from its plastic support posts and put it aside (fig. 8.21).

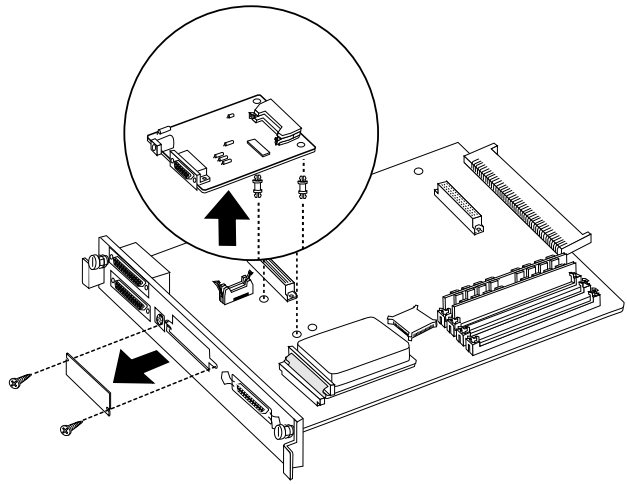

Fig. 8.21 *Remove the Network Interface Board*

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4. Place the two shunts on jumpers JP1 and JP2 (fig. 8.22). Make sure both sets of pins are covered by the shunts.

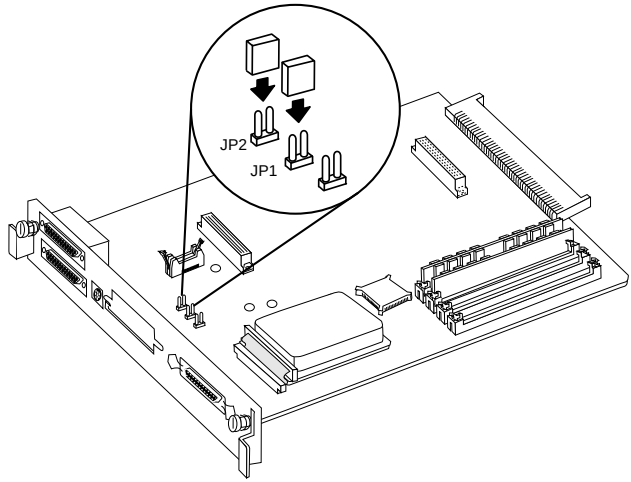

Fig. 8.22 *Place the Shunts on the Jumpers*

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5. Use a flat-tipped screwdriver to remove the existing 1K-ohm DIP resistor from the RP1 socket (fig. 8.23). Gently slide the screwdriver under the resistor and lift it up and off the controller board.

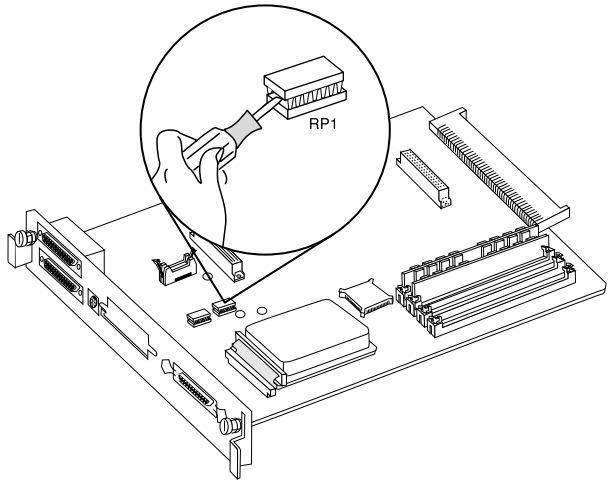

Fig. 8.23 *Remove the DIP Resistor*

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6. Line up the notch on the 220-ohm DIP resistor with the notch on the RP1 socket. Carefully insert the resistor's pins in the socket. Then align and install the 330-ohm DIP resistor in the RP2 socket the same way (fig. 8.24).

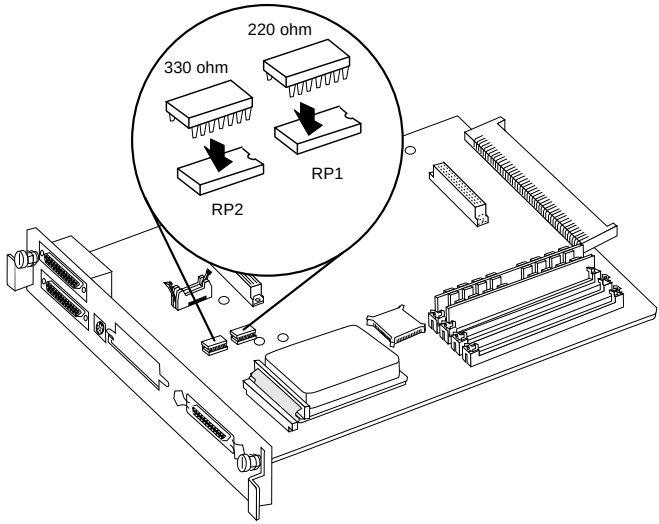

Fig. 8.24 *Insert the New DIP Resistors*

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7. If you didn't remove a network interface board, skip to step 8. If you need to replace your network interface board installed, follow the instructions below:

   a. Snap the network interface card onto the plastic support posts (fig. 8.18).

   b. Using the two screws you removed earlier, refasten the interface plate to hold the network card in place (fig. 8.18).

   c. Hold the plastic ribbon cable so that the notch (key) on one end faces upward and slide it onto the interface card connector (fig. 8.19).

8. Make sure no components on the board shifted or loosened during the procedure, especially the SIMMs.

9. Follow the instructions in "Replacing the Controller Board" (earlier in this chapter), being careful to eliminate static electricity.

10. Use the 50-pin to 36-pin cable included in your kit to connect the Dataproducts cable to the parallel port.

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Internal Hard Disk Installation

These instructions explain how to replace the internal hard disk.

Make sure you have all the parts necessary for the procedure. The internal hard disk upgrade kit includes the following:

- An internal hard disk
- An antistatic wristband

1. Follow the instructions in “Removing the Controller Board” (earlier in this chapter), being careful to eliminate static electricity before you begin.
2. Orient the controller board so that the side with the SIMMs is closest to you and the parallel port is located on your left side.
3. Disconnect the ribbon cable from the hard disk but leave the cable attached to the controller board.

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4. Remove the old disk by pulling up on each corner while steadying the board near the disk with one hand (fig. 8.25).

CAUTION: This disk fits tightly, so you have to pull firmly, but be careful not to flex the controller board while doing so.

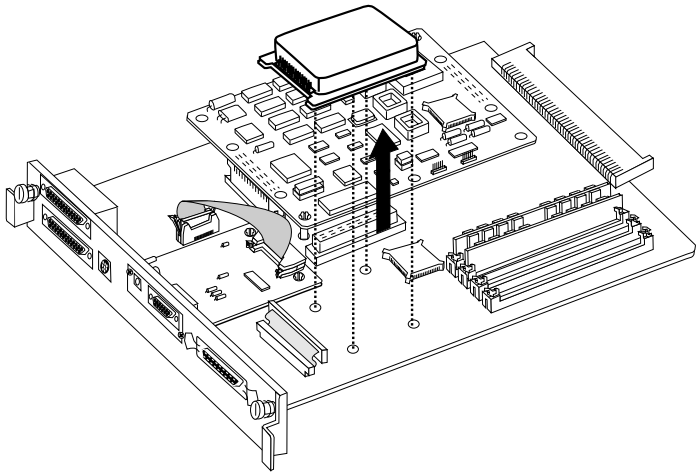

Fig. 8.25 *Remove the Old Hard Disk*

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5. Hold the new disk vertically (connector-side down with the bracket facing the SIMMs) and connect it to the ribbon cable (fig. 8.26). Inspect the connection from all four sides to **make sure each pin is seated in the connector** (no pins are exposed).

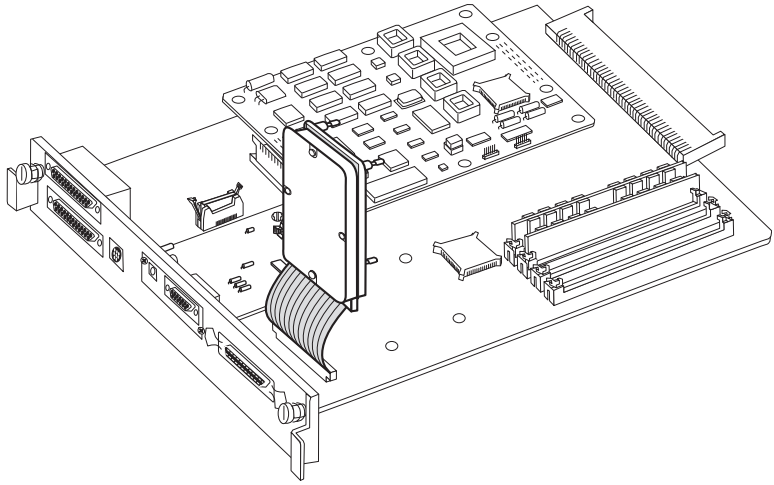

Fig. 8.26 *Install the New Hard Disk*

6. Align the new disk over its position on the board, then attach it to the board by pressing firmly on the corners (not the center) with one hand while steadying the board with the other hand as you snap the disk in place.

7. Make sure no other components on the board shifted or loosened during the installation procedure, especially the SIMMs and any optional interface boards.

8. Follow the instructions in “Replacing the Controller Board” (earlier in this chapter), being careful to eliminate static electricity.

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If the printer fails to work properly after you replace the hard disk, check the following:

- Make sure the power cord and all interface cables are connected correctly and tightly, and that the printer power is on.
- Make sure that you didn't miss any pins when you reattached the ribbon cable (no pins should be exposed).
- Make sure no other components shifted or loosened during the installation procedure, especially the SIMMs and any optional interface boards.

If you've checked all of the above and the printer still doesn't work properly, see appendix A, "QMS Customer Support," for information on how to contact us.

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Using External Hard Disks

In addition to the internal hard disk, your printer supports up to six optional external hard disks through its SCSI port. When an external hard disk is connected to the printer, you control the disk through the Administration/Disk Operations submenu (fig. 8.27). This section explains how to use the Disk Operations submenu to download and remove fonts or emulations. (You can also load optional fonts and emulations from cards as described earlier in this chapter in "Using Font and Emulation Cards.")

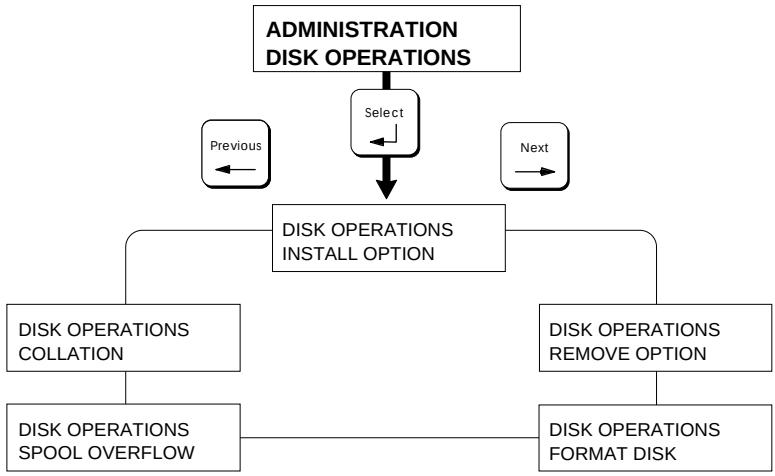

Fig. 8.27 *Disk Operations Submenu*

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CAUTION: If you connect to this printer an external hard disk you previously used with an earlier QMS Crown printer, this QMS *magicolor* LX software automatically reorganizes the files on the external hard disk when the printer is turned off and back on. Once this reorganization is done, the files on the hard disk can no longer be accessed if the hard disk is reattached to an earlier QMS Crown printer. The printer release number is indicated on the status and start-up pages.

This reorganization takes time. Don't interrupt the reorganization, because all files on the disk might be lost.

NOTE: If an error occurs during these operations, an error message displays until you press the Menu key. You must then restart the operation from the beginning. Two error messages you may see are `READ FAILURE` (the disk has encountered a read error) and `WRITE ERROR` (either the hard disk had a write error or there is no room for data on the hard disk or in RAM).

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Identifying External Hard Disks

The external hard disks are identified by their device numbers; these numbers can range from DSK0 to DSK5 (fig. 8.28). The internal disk in your printer is always DSK6. Device numbers of external disks can be configured by the installer.

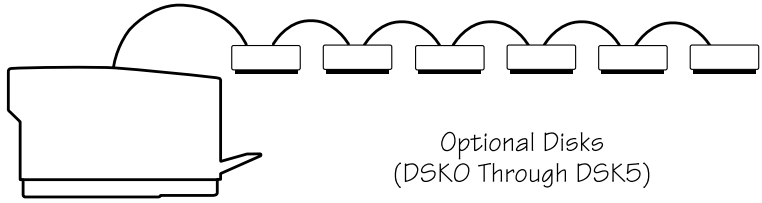

Fig. 8.28 *External Hard Disk Device Numbers*

Formatting an External Hard Disk

You have two methods of formatting an external hard disk:

- Formatting via the Control Panel
- Formatting via PS Executive Series Utilities

CAUTION: Be extremely careful when formatting hard disks. Only format DSK6, which contains the system software, if there is a specific reason to do so. For example, you might reformat the disk to clear up unexplained disk behavior or to avoid a service call. If you want to format DSK6, use the procedure in "Formatting the Internal Hard Disk" in this chapter. If you do format DSK6, you will not be able to use the printer until you reload the system software (provided on a with your printer). See "Installing Print System Software and Fonts" later in this chapter for details.

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Formatting an External Hard Disk via the Control Panel

Use the following procedure to format an external hard disk using the printer's control panel.

NOTE: If the `FORMAT FAILED` message displays in the message window during the Format Disk operation, the disk cannot be used. Press the Menu key to remove the message and contact your printer vendor.

1. With the printer off line (the Online LED is off), press the Menu and Next keys to display the message

   ```
   ADMINISTRATION
   DISK OPERATIONS
   ```

2. Press the Select key to enter the Disk Operations menu. Then, if necessary, press the Next key to display the message

   ```
   DISK OPERATIONS
   FORMAT DISK
   ```

3. Press the Select key to enter the Format Disk submenu.

4. Press the Next key until the address of the hard disk you want to format displays in the message window; then press the Select key.

5. When you are prompted

   ```
   ARE YOU SURE?
   NO
   ```

   press the Next key to display the message

   ```
   ARE YOU SURE?
   YES
   ```

6. Press the Select key to start the format procedure.

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CAUTION: During the formatting procedure, various messages may appear, the printer automatically restarts, and the control panel lights flash. Do not interrupt this process because the formatting will be incorrect.

7. When the format procedure is complete, the following message momentarily displays:

   ```
   FORMAT DISK
   FORMAT COMPLETE
   ```

   and then message window displays

   ```
   IDLE
   ```

Formatting an External Hard Disk via PS Executive

PS Executive Series Utilities offer formatting options for both Macintosh and PC setups. See the README file on the PS Executive disk for information on installing the utilities and see the on-line documentation for details on formatting disks.

Installing an Optional Card Font or Emulation

To install optional fonts and emulations on a hard disk, use the following procedure:

1. Make sure the printer is off line. Press the Menu key to display

   ```
   CONFIGURATION
   ADMINISTRATION
   ```

2. Press the Select key to enter the Administration menu; then press the Next key to display

   ```
   ADMINISTRATION
   DISK OPERATIONS
   ```

3. Press the Select key to enter the Disk Operations menu. Press the Next key to display

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```
DISK OPERATIONS
INSTALL OPTION
```

4. Press the Select key to enter the Install Option submenu. Press the Next key until the hard disk destination of the optional font or emulation displays in the message window.
5. Press Select to enter the destination. Then, press the Next key until the source of the optional font or emulation displays in the message window.
6. When you are prompted, insert the font or emulation card into a slot on the front of the printer.
7. Press the Select key to enter the source. The printer copies the contents of the card to the hard disk.
8. When the copying process is complete, press the Menu key to exit the menu.
9. To remove the card, use the following procedure:
    a. If you are removing an LN03 Plus or a ProCollection font card, turn off the printer. Otherwise, make sure the printer is off line (use the Online/Offline key to turn off the LED).
    b. Pull the card out gently.
    c. Turn on the printer, if it's off, and put it back on line.

NOTE: To use these fonts or emulations from an application, make sure the printer driver installed supports them. If not, contact your application manufacturer for a driver that supports them.

Removing an Optional Card Font or Emulation

To remove an installed option from a hard disk, you need the original font or emulation card containing the files. Use the following procedure:

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1. Make sure the printer is off line. Press the Menu key to display

   ```
   CONFIGURATION
   ADMINISTRATION
   ```

2. Press the Select key to enter the Administration menu; then press the Next key to display

   ```
   ADMINISTRATION
   DISK OPERATIONS
   ```

3. Press the Select key to enter the Disk Operations submenu. Then press the Next key to display

   ```
   DISK OPERATIONS
   REMOVE OPTION
   ```

4. Press the Select key to enter the Remove Option submenu. Press the Next key until the address of the hard disk containing the optional font or emulation displays in the message window, then press the Select key.

5. When you are prompted, insert the card into the card slot. The printer compares the contents of the disk with the contents of the card and deletes the matching files from the hard disk.

6. When the file removal process is complete, press the Menu key to exit the menu.

7. To remove the card, use the following procedure:

   a. If you are removing an LN03 Plus or a ProCollection card, turn off the printer. Otherwise, make sure the printer is off line (use the Online/Offline key to turn off the LED).

   b. Pull the card out gently.

   c. Turn on the printer, if it's off, and put it back on line.

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Formatting the Internal Hard Disk

If you experience unexplained or erratic problems with the internal hard disk, you may want to reformat the hard disk and reload the print system software.

NOTE: If you reformat the internal hard disk, all files on that disk are erased, and the system software and fonts must be reloaded.

To format the internal hard disk, follow these instructions:

1. Turn off the printer and then on again. The following message displays in the window:

   ```
   QMS SOFTLOAD x.x
   READY TO BOOT
   ```

2. Once this message appears, you have 10 seconds to press the Select key. When you press the Select key, the following message appears in the message window:

   ```
   QMS SOFTLOAD x.x
   BOOT SYSTEM
   ```

   NOTE: If 10 seconds passes before you press the Select key, the `IDLE` message appears. You must return to step 1.

3. Press the Next key until `FORMAT DISK` appears on the second line of the message window:

   ```
   QMS SOFTLOAD x.x
   FORMAT DISK
   ```

4. Press the Select key to enter the Format Disk submenu. Then press the Next key until the following message appears in the message window:

   ```
   FORMAT DISK
   DISK 6
   ```


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5. Disk 6 is the printer's internal hard disk. Press the Select key. The following message displays:

   ```
   FORMAT
   ARE YOU SURE?
   ```

   NOTE: If you decide not to format the internal hard disk, press the Menu key to back out of the submenus. When you reach the top level, you can use the Next or Previous key to select the menu you want.

6. Press the Select key to begin formatting. The message window displays:

   ```
   FORMAT DISK
   FORMATTING
   ```

   Then when formatting is finished, the message window displays:

   ```
   FORMAT DISK
   COMPLETED
   ```

7. Press the Menu key until the following message appears:

   ```
   QMS SOFTLOAD x.x
   INSTALL TO DISK
   ```

8. Go to the next section for information on reinstalling the system software and fonts.

Installing Print System Software and Fonts

NOTE: The system software and fonts provided with the *magicolor* LX printer will not function in other versions of the *magicolor* printer (such as the *magicolor* or the *magicolor* Plus). If *magicolor* LX software or fonts are downloaded to a non-*magicolor* LX printer, an error message will appear on the start-up page.

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Print system software and font backup disks are supplied with the printer in case you ever need to reinstall them. For example, if the printer's internal hard disk is reformatted, the system software and fonts will need to be reinstalled.

The procedure for downloading system software depends on whether the printer software is functional (the printer starts up normally and `IDLE` appears in the message window) or non-functional (the system software cannot start up), and whether you are sending from a PC or a Macintosh. Printer fonts would only ever need to be reinstalled if the printer software is not functional.

NOTE: When you reload the system software, the printer configuration is returned to its factory default settings, so you may want to print out an advanced status page from the Administration/Special Pages submenu so you have a record of current configuration-menu settings. See chapter 4, "Printer Configuration," of your *User's Guide* for information on using the configuration menu..

Installing System Software from a PC to a Functional Printer

1. Make sure you have PS Executive Series printer utilities (provided on a disk with your printer) installed on your PC. Installation instructions are in the README file on the PS Exec disk.
2. Make sure the printer is on and that the system software is functioning normally (`IDLE` appears in the message window). If the system software is not functioning, see "Installing System Software and Fonts from a PC to a Non-Functional Printer," below.
3. Insert the System Software/DOS disk (provided with your printer) into your PC's floppy disk drive.

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4. At the DOS C:\ prompt, type the following commands to extract the system software file to your PC's hard disk:

NOTE: This file takes up about 2.5 MB of disk space when extracted.

```
md \qmssys↵
cd \qmssys↵
a:system↵
```

If the system software disk is in another floppy disk drive, substitute the name of that drive for `a`.

5. At the DOS C:\QMSSYS prompt, type the following command to make sure the SYSTEM.DL file is in the QMSSYS directory:

```
dir↵
```

6. Start PS Exec.

7. Choose Download System Code from the PS Exec File menu. The Download System Code dialog box appears.

8. In the Download System Code dialog box, find and select SYSTEM.DL.

9. Choose the Send button to start the download.

When downloading is complete, `IDLE` appears on the printer's message window.

10. When the software has finished installing, turn the printer off and on again to activate the new code.

11. At the DOS C:\QMSSYS prompt, type the following command to delete the SYSTEM.DL file from the QMSSYS directory:

```
del *.dl↵
```


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Installing System Software and Fonts from a PC to a Non-Functional Printer

Follow these instructions to download system software and fonts from a PC to a non-functional printer:

NOTE: These files take up about 5.5 MB of disk space when extracted.

1. Insert the System Software/DOS disk (provided with your printer) into your PC's floppy disk drive.
2. At the DOS C:\ prompt, type the following command to extract the system software file to your PC's hard disk:

   ```
   md \qmssys↵
   cd \qmssys↵
   a:system↵
   ```

   If the system software disk is in another drive, substitute the name of that drive for `a.`
3. Insert the System Fonts 1/DOS disk into your PC's floppy disk drive.
4. Type the following command to extract the first PostScript fonts file to your PC's hard disk:

   ```
   a:af2psfn1↵
   ```
5. Insert the System Fonts 2/DOS disk into your PC's floppy disk drive.
6. Type the following command to extract the second PostScript fonts file to your PC's hard disk:

   ```
   a:af2psfn2↵
   ```
7. Insert the PCL 5 Fonts/DOS disk into your PC's floppy disk drive.

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8. Type the following command to extract the PCL 5 fonts file to your PC's hard disk:

   ```
   a:af2pclfn↵
   ```

9. At the DOS C:\QMSSYS prompt, type the following command to make sure these files are in the QMSSYS directory: SYSTEM.DL, AF2PSFN1.DL, AF2PSFN2.DL, and AF2PCLFN.DL:

   ```
   dir↵
   ```

10. Turn the printer off and then on again. The following message displays in the window:

    ```
    QMS SOFTLOAD x.x
    READY TO BOOT
    ```

11. Immediately press the Select key (before this message disappears). When you press the Select key, the following message appears in the message window:

    ```
    QMS SOFTLOAD x.x
    BOOT SYSTEM
    ```

    NOTE: If 10 seconds passes before you press the Select key, the `IDLE` message appears, and you must return to step 2.

12. Press the Next key until `INSTALL TO DISK` appears on the second line of the message window:

    ```
    QMS SOFTLOAD x.x
    INSTALL TO DISK
    ```

13. Press the Select key to enter the Install to Disk submenu. Then press the Next key until the name of the communication port you're using appears in the second line of the message window, for example:

    ```
    INSTALL TO DISK
    PARALLEL
    ```


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14. Press the Select key to enter the communication port submenu. The following appears on the second line of the message window:

    ```
    TARGET DISK 6
    ```

15. Press the Select key. The following message appears in the window:

    ```
    INSTALL TO DISK
    CONNECTING....
    ```

16. At your PC, at the C:\QMSSYS prompt, send the files you just extracted to the parallel port using the DOS **copy** command with the **/b** (binary file) option:

    ```
    copy /b *.dl lpt1:↵
    ```

    The software is installed when the following message appears:

    ```
    INSTALL TO DISK
    COMPLETE
    ```

    Once you have completed installing the system software, you are ready to restart the system as described here:

17. Press the Menu key. The message window displays the following message:

    ```
    QMS SOFTLOAD x.x
    INSTALL TO DISK
    ```

18. Press the Next key until the message window displays the following message:

    ```
    QMS SOFTLOAD x.x
    BOOT SYSTEM
    ```

19. Press the Select key to enter the Boot System submenu. The following message appears in the message window:

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```
BOOT SYSTEM
HARD DISK
```

20. Press the Select key and the following message appears:

```
BOOT SYSTEM
HARD DISK 6
```

21. Press the Select key. The system begins loading, and the following message displays:

```
BOOT SYSTEM
LOADING
```

22. At this point, **DO NOT TOUCH ANY KEYS** until the following message appears:

```
IDLE
```

NOTE: If you do touch some keys during this step, you must go back to step 9 and start from there again.

23. At the DOS C:\QMSSYS prompt, type the following command to delete the system and font files from your PC's hard disk:

```
del *.dl↵
```

Installing System Software from a Macintosh to a Functional Printer

NOTE: This installation procedure uses the LocalTalk port.

1. Turn on the printer and wait for `IDLE` to appear in the message window.

   If the current printer system software is not functioning, see "Installing System Software and Fonts from a Macintosh to a Non-Functional Printer," below.

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2. Make sure you have PS Executive Series utilities (provided on a disk with your printer) installed on your Macintosh. Installation instructions are in the README file on the PS Exec disk.

3. Use the following procedure to decompress the SystemLoader program and install it on your Macintosh's hard disk:

   a. Insert the System Software/Macintosh disk (provided with your printer) in your Macintosh's floppy disk drive.

   b. Double-click the SystemLoader icon.

   c. Specify a folder when the program asks for a place to install SystemLoader.

   d. Choose the Save button.

4. Start PS Exec.

5. Choose Download System Code from the PS Exec File menu. The Download System Code dialog box appears.

6. In the Download System Code dialog box, find SystemLoader and select it.

7. Choose the Send button to start the download.

   When downloading is complete, the message `"Download Complete!"` appears on the Macintosh screen, and `IDLE` appears on the printer's message window.

8. Restart the printer to activate the new system software.

Installing System Software and Fonts from a Macintosh to a Non-Functional Printer

If the current printer system software is not functioning, you must connect your Macintosh to the printer's serial port to reinstall the system software and the printer fonts. The download will not work over the LocalTalk interface in this case. Your Macintosh vendor

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can provide you with a cable (with DIN-8 female and DB-25 male connectors) for this, or you can see appendix B, "Technical Specifications," for the correct cable pinouts.

NOTE: If you have access to a PC, printer system software and fonts can also be downloaded from the PC to the printer's parallel or serial port. See "Installing System Software and Fonts from a PC to a Non-Functional Printer," earlier in this chapter, for instructions.

1. Connect the printer serial port to the Macintosh's printer or modem port. The modem port provides the fastest download.
2. Use the following procedure to decompress the SystemLoader program and install it on your Macintosh's hard disk:
   a. Insert the System Software/Macintosh disk (provided with your printer) in your Macintosh's floppy disk drive.
   b. Double-click the SystemLoader icon.
   c. Specify a folder when the program asks for a place to install SystemLoader.
   d. Choose the Save button.
3. Turn the printer off and then on again. Wait until the following message displays in the message window:

   ```
   QMS SOFTLOAD x.x
   READY TO BOOT
   ```

   Then immediately press the Select key. The following message appears:

   ```
   QMS SOFTLOAD x.x
   *BOOT SYSTEM
   ```

4. Press the Next key until INSTALL TO DISK appears on the second line of the message window:

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```
QMS SOFTLOAD x.x
INSTALL TO DISK
```

5. Press the Select key to enter the Install to Disk submenu.

6. Press the Next key until SERIAL appears in the second line of the message window:

```
INSTALL TO DISK
SERIAL
```

7. Press the Select key to enter the Serial submenu. The following message appears:

```
SERIAL
TARGET DISK 6
```

8. Press the Select key. The following message appears in the window:

```
INSTALL TO DISK
CONNECTING....
```

9. At the Macintosh, start SystemLoader from your hard disk by double-clicking the SystemLoader icon.

10. In the dialog box that appears, make sure the correct download port is selected; then choose the Send button to start the download.

    When the downloading process is complete, the message "Download Complete!" appears on the Macintosh screen and the following appears in the printer message window:

```
INSTALL TO DISK
COMPLETE
```

    Now use the following procedure to install the printer PostScript fonts:

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11. At the printer control panel, press the Menu key. The following appears in the printer message window:

    ```
    QMS SOFTLOAD x.x
    INSTALL TO DISK
    ```

12. Press the Select key to enter the Install to Disk submenu.

13. Press the Next key until `SERIAL` appears in the second line of the message window:

14. Press the Select key to enter the `SERIAL` submenu. The following message appears:

    ```
    SERIAL
    TARGET DISK 6
    ```

15. Press the Select key. The following message appears in the window:

    ```
    INSTALL TO DISK
    CONNECTING....
    ```

16. At the Macintosh, insert the disk labeled System Fonts 1/Macintosh (shipped with your printer) in your Macintosh's floppy disk drive.

17. Start FontLoader from the floppy disk drive by double-clicking the FontLoader icon.

NOTE: It's not necessary to copy FontLoader to the hard drive. This does not speed up the downloading process.

18. In the dialog box that appears, make sure the correct download port is selected; then choose the Send button.

    When the font downloading is complete, the message `"Download Complete!"` appears on the Macintosh screen and the following appears in the printer message window:

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```
INSTALL TO DISK
COMPLETE
```

19. Repeat steps 11 through 18 to install the rest of the printer fonts on the disk labeled System Fonts 2/Macintosh.

20. When the system software and fonts are loaded use the following procedure to restart the printer:

    a. At the printer control panel, press the Menu key. The following appears in the printer message window:

    ```
    QMS SOFTLOAD x.x
    INSTALL TO DISK
    ```

    b. Press the Next key until the message window displays the following message:

    ```
    QMS SOFTLOAD x.x
    BOOT SYSTEM
    ```

    c. Press the Select key to enter the Boot System submenu. The following message appears in the message window:

    ```
    BOOT SYSTEM
    HARD DISK
    ```

    d. Press the Select key and the following message appears:

    ```
    BOOT SYSTEM
    HARD DISK 6
    ```

    e. Press the Select key. The system begins loading, and the following message displays:

    ```
    BOOT SYSTEM
    LOADING
    ```

At this point, DO NOT TOUCH ANY KEYS until the following message appears in the printer message window:

```
IDLE
```


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NOTE: If you do touch some keys during this step, you must go back to step 20a and start from there again.

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Chapter 9

Troubleshooting

Chapter highlights:

- Responding to status messages
- Clearing media jams
- Preventing media jams
- Internal hard disk problems
- Miscellaneous problems: a quick check
- Mechanical problems
- Print quality problems
- Placing a service call

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Introduction

This chapter explains how to deal with control panel messages, remove jams, cancel jobs, and troubleshoot printer problems.

Responding to Status Messages

The following status messages may appear in the control panel message window:

***x* ACTIVE JOBS**	The printer is on line, and one or more jobs are in progress. The *x* is replaced by the number of jobs in the queue.
ADJUST *xxxxx* BIN	A media cassette is either not installed or installed incorrectly. The *xxxxx* indicates the cassette in question. Either install or reinstall the indicated cassette.
BACK PANEL OPEN	The back cover over the transfer unit is not fully closed. Close the back cover.
BELT CARTRIDGE MIS-INSTALLED	The OPC belt cartridge is either not installed or incorrectly installed. Either install a cartridge if one is not present or reinstall the current one correctly. (See chapter 6, "Consumables and Preventative Maintenance," for information on replacing the OPC belt cartridge.)
CANCELLING JOB	The Cancel key has been used to cancel the current job. This message is displayed until the job is cancelled.
CHECK WASTE TONER	The waste toner pack is full and needs to be replaced or is not installed properly. See "Replacing the Waste Toner Pack" in chapter 6 for details.
CLOSE MANUAL FEED TRAY	The manual feed tray is open when a file is being sent to print from another cassette. Close the manual feed tray.
***x* DEV LOW**	A developer cartridge is running low and needs to be replaced. The *x* is replaced by the color of the developer

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cartridge that needs attention. After installing the new cartridge, you have to clear this message through the control panel using the Clear Warning option. (See chapter 6, "Consumables and Preventative Maintenance," for details on replacing the developer cartridge and "Administration/Engine" in chapter 4 for details on clearing the warning.)

***x* DEVELOPER UNIT MIS-INSTALLED** A developer cartridge is not installed or installed incorrectly. The *x* is replaced by the color of the developer unit that needs attention. Either install a developer cartridge if one is not present or reinstall the current one correctly. (See chapter 6, "Consumables and Preventative Maintenance," for information on replacing the developer cartridge.)

FUSER OIL LOW The oil bottle for the fuser unit is running low. If you have a new bottle on hand, you may want to change the bottle now. (See chapter 6, "Consumables and Preventative Maintenance," for information on replacing the oil bottle.) If not, order a replacement bottle now. A limited number of copies (approximately 100) will still run. However, when the oil runs out, the printer stops and the `FUSER OIL EMPTY` status message appears.

FUSER OIL EMPTY The oil bottle for the fuser unit is empty. The printer will not run anymore copies until the bottle is replaced. (See chapter 6, "Consumables and Preventative Maintenance," for information on replacing the oil bottle.)

IDLE No jobs are in progress.

IDLE INPUT PRINTING The system is on line and printing previously accepted jobs. No new jobs are arriving at the communication interfaces.

INNER JAM Media has jammed leaving the OPC belt cartridge area. Remove the jam (see the "Inner Jam" section later in this chapter for details).

INITIALIZING The printer is warming up and getting ready to go on line.

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MISFEED JAM	Media has jammed leaving the media cassette. Remove the jam (see the "Misfeed Jam" section later in this chapter for details).
OUTER JAM	Media has jammed leaving the paper exit unit. Remove the jam (see the "Outer Jam" section later in this chapter for details).
PRINTING STATUS	A status page has been requested via the Print Status option in the Administration/Special Pages menu. This does not necessarily mean that the status page is printing at the particular moment the message is displayed since other jobs may be ahead of it in the job queue.
PRINTING TEST	A sample page or a registration page has been requested. This does not necessarily mean that the page is printing as the message is being displayed (other jobs may be ahead of it in the job queue).
PUT *xxxxxx* PAPER IN *xxxxx* INPUT BIN	A media cassette is empty; reload the cassette. *xxxxxx* PAPER is the media size the cassette is currently configured for. *xxxxx* INPUT BIN is the empty cassette. (See chapter 5, "Print Media and Daily Operations," for information on refilling cassettes.)
REPLACE BELT	The OPC belt cartridge needs to be replaced. After installing the new cartridge, you have to clear this message through the control panel using the Clear Warning option. (See chapter 6, "Consumables and Preventative Maintenance," for details on replacing the OPC belt cartridge and "Administration/Engine" in chapter 4 for details on clearing the warning.)
SIDE PANEL OPEN	The waste toner cover is not fully closed. Close the cover.
TOP COVER OPEN	The top cover of the printer is either off or partially open. Make sure it is seated properly and fully closed.
***x* TONER EMPTY**	A toner cartridge is empty. The *x* is replaced by the color of the toner cartridge that needs to be replaced. (See chapter 6, "Consumables and Preventative Maintenance," for information on replacing a toner cartridge.)

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WAITING ON INPUT END JOB? The printer compiler is waiting on incoming data for the first job in the job queue. It is possible that the job did not end with an end-of-job indicator and therefore cannot end by itself. The message is displayed in case you want to cancel the job or send an end-of-job indicator. The message disappears if more input arrives from the port, if the relevant specified timeout elapses, or if you send an end-of-job indicator. No other jobs can be printed until this job has ended.

WARMING UP The printer is warming up; the fuser is at a low temperature. Wait until the printer has warmed up before you print.

Service Call Messages

CALL FOR SERVICE A mechanical error has occurred and a service call is required. Before calling for service, make a note of the full message in the message window. See appendix A, "QMS Customer Support," for information on how to contact QMS. When a `CALL FOR SERVICE` *x* appears, the printer stops until the required service is complete.

100K CHECKUP Approximately 100,000 copies have been printed. It's time for periodic maintenance and parts replacement to protect your printer and maintain print quality.

REPLACE FUSER Approximately 60,000 copies have been printed. It's time to replace the fuser to ensure print quality and reduce wear on your printer.

The `100K CHECKUP` and the `REPLACE FUSER` messages can be cleared through the Clear Warning option in the Administration/Engine menu. Then, you can continue to use the printer. (See "Administration/Engine" in chapter 4 for details on clearing the warning.)

CAUTION: We strongly recommend that you have the fuser replaced or the 100,000 copy checkup done as soon as possible after a message appears. If you clear one of these messages, the

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counter that tracks that particular service resets to 0 and the message does not reappear until after another complete cycle. If you continue to use the printer without the proper maintenance or part replacement, print quality can deteriorate and the wear on the printer can shorten the printer's life.

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Clearing Media Jams

When a jam occurs, the message window on the control panel displays one of three messages, `MISFEED JAM`, `INNER JAM`, or `OUTER JAM`. The following sections contain procedures for clearing each type of jam.

Clearing Misfeed Jams

When the control panel message window displays `MISFEED JAM`, media has jammed while leaving the media cassette or the manual feed tray. To clear this jam, use the following procedure:

1. Pull out the media cassette (fig. 9.1), and check the media-cassette slot. If media is there, skip to step 4. If not, continue to step 2.

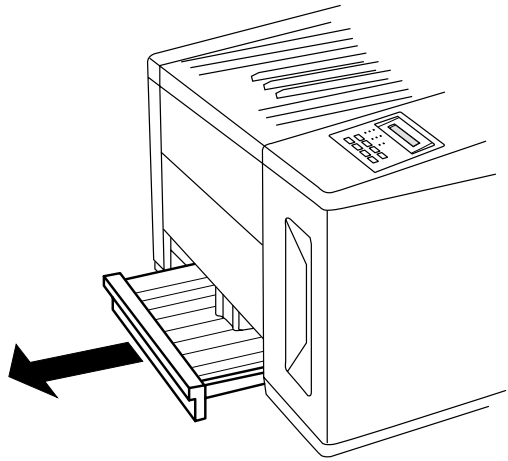

Fig. 9.1 *Remove the Paper Cassette*

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2. Locate the manual-feed platform: it's a black plastic tray at the top of the media-cassette slot.

3. Remove the manual-feed platform by lifting it up and forward at the front until it drops out (fig. 9.2).

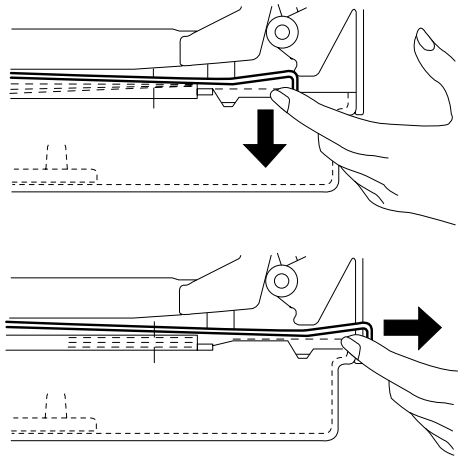

Fig. 9.2 *Remove Top Tray of Cassette Slot*

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4. Remove any jammed media you see (fig. 9.3).

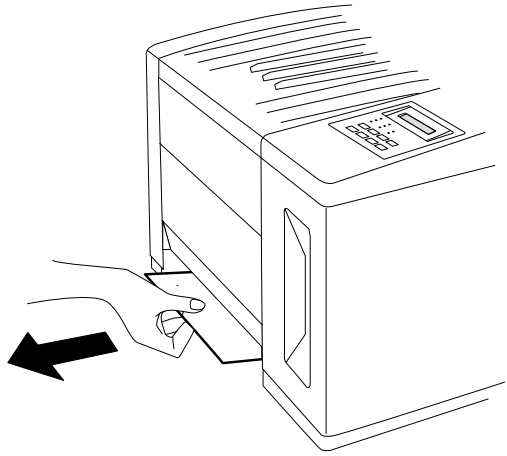

Fig. 9.3 *Remove the Jammed Media*

5. Check to be sure no other pieces of media are lodged farther back in the slot. Then, if you removed the manual-feed platform, replace it. (Push it back into the printer until it is secure.)
6. Make sure the media in the cassette is in good condition, lies flat, and does not exceed the upper-limit mark on the cassette.
7. Slide the cassette back into the printer until it's secure.
8. Open and close the top cover to clear the jam message in the control panel window.

When the control panel message window displays `IDLE`, the printer is ready to print.

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Clearing Inner Jams

When the control panel message window displays `INNER JAM`, media has jammed leaving the OPC belt cartridge, and the leading edge has jammed around the transfer area. To clear this jam, use the following procedure:

1. Open the back cover by pressing the top-right corner to release the spring latch (fig. 9.4).

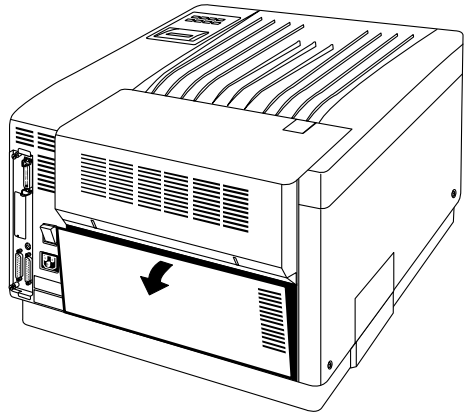

Fig. 9.4 *Open the Back Cover*

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2. Open the transfer unit by grasping it in the center by the green handle and pulling it toward you and down (fig. 9.5).

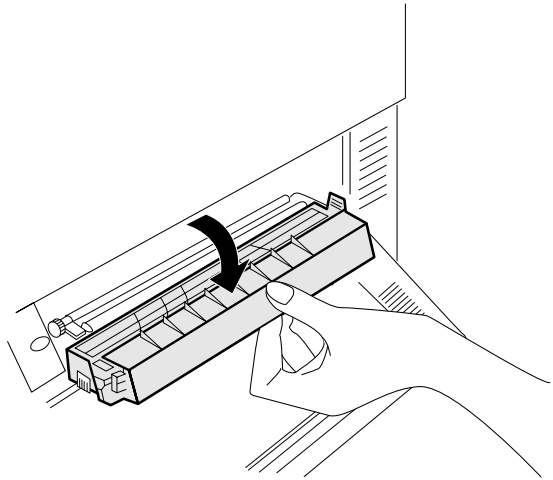

Fig. 9.5 *Open the Transfer Unit*

NOTE: To avoid damage to the rollers, always remove jammed media gently. Also, toner images on the media aren't fused (set), which means toner is still loose. Avoid getting toner on your hands and clothes while removing the jammed media. If you accidentally get toner on your hands or clothes, lightly dust off as much as possible. If some toner remains, use cool, not hot water, to rinse it off your hands or washable clothing.

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3. Remove the jammed media if the media is around the drum by using the following procedure. Otherwise, skip to step 4.

   a. Open the manual feed tray by pressing the top, right corner (fig. 9.6).

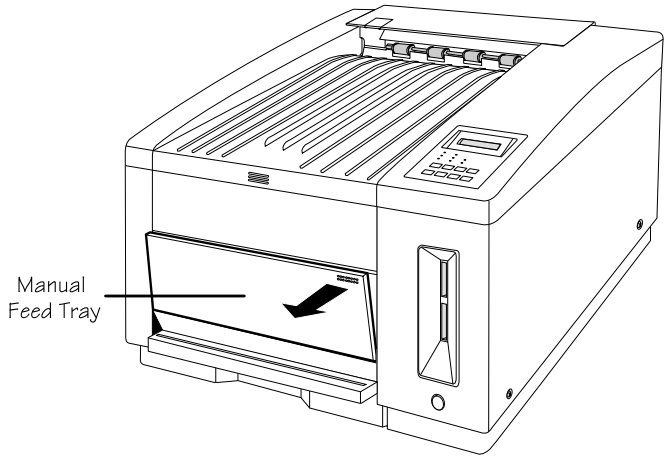

Fig. 9.6 *Open the Manual Feed Tray*

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b. Pull up the green handle on the OPC belt cartridge and then pull the cartridge out about 2" (5 cm) to relieve tension on the drum.

c. Remove the media from the transfer unit end of the printer (fig. 9.7).

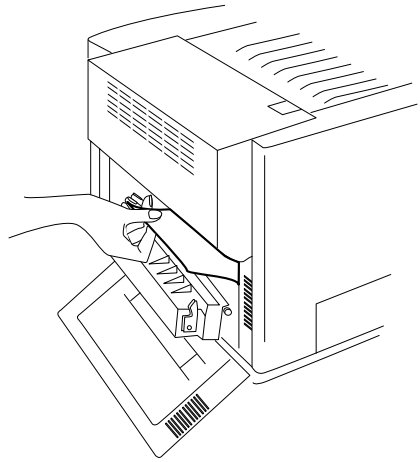

Fig. 9.7 *Remove the Jammed Media*

d. Close the transfer unit and the back cover.

e. Firmly push the OPC belt cartridge back into the printer until it snaps into place. The cartridge is in place when you can see the green arrows on the left and right inside metal frame of the printer. Then, push down the green handle to lock the OPC cartridge in place, and close the manual feed tray.

f. Skip to step 5.

4. Remove the jammed media if the media is around the fuser roller by using the following procedure.

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WARNING! The fuser unit is hot! Do not remove a jam in this area until the fuser unit cools.

ACHTUNG! Die Fixiereinheit wird sehr heiß! Bitte achten Sie darauf, daß sie diese einige Zeit abkühlen lassen, bevor Sie einen Papierstau beseitigen.

a. Open the paper exit unit. (See "Installing the Cleaning Pad and Oil Bottle" in chapter 2 if you are not sure how to do this.)

b. Remove the jammed media by pulling it straight out from above the transfer unit (fig. 9.8).

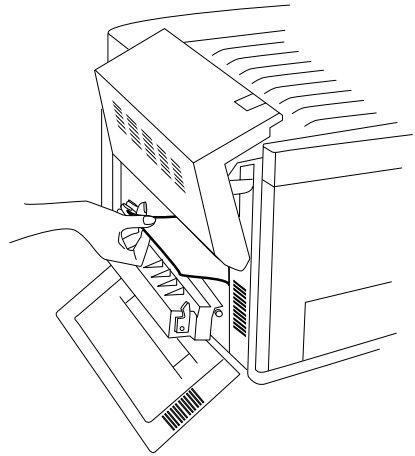

Fig. 9.8 *Remove Media from the Transfer Unit Area*

5. Close the transfer unit, and then the back cover.

6. Close the paper exit unit.

When the control panel message window displays `IDLE`, the printer is ready to print.

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Clearing Outer Jams

When the control panel message window displays OUTER JAM, media has jammed leaving the paper exit unit. To clear this jam, use the following procedure:

1. Open the back cover by pressing the top-right corner to release the spring latch (fig. 9.9).
2. Open the transfer unit by grasping the green handle in the center and pulling it toward you and down (fig. 9.9).

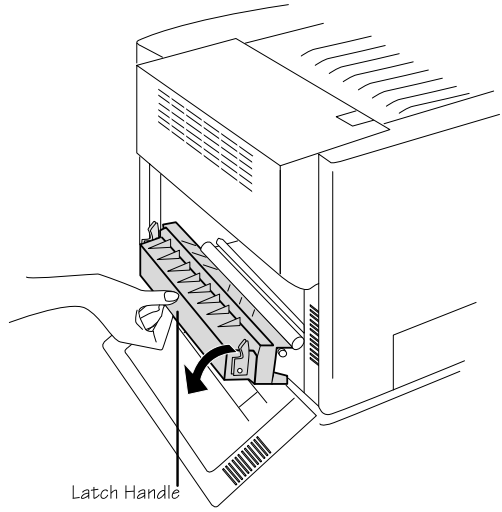

Fig. 9.9 *Open the Transfer Unit*

WARNING! The fuser unit is hot! Do not remove a jam in this area until the fuser unit cools.

ACHTUNG! Die Fixiereinheit wird sehr heiß! Bitte achten Sie darauf, daß sie diese einige Zeit abkühlen lassen, bevor Sie einen Papierstau beseitigen.

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3. Open the paper exit unit (fig. 2.13).
4. Open the pressure-release lever on the fuser unit (fig. 9.10).

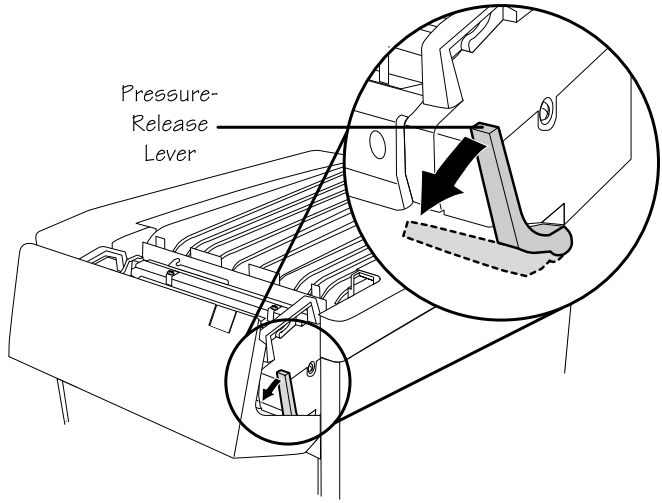

Fig. 9.10 *Open the Pressure-Release Lever*

CAUTION: If you can see the outer jam in the transfer unit, always remove it by pulling the media out through the transfer unit, not up and out the paper exit unit. This prevents the unfused toner from coming off on the exit rollers and getting down into the printer.

Since toner images on the media aren't set, avoid getting loose toner on your hands and clothes while removing the jammed media. If you accidentally get toner on your hands or clothes, lightly dust off as much as possible. If some toner remains, use cool, not hot water, to rinse it off your hands or washable clothing. To avoid damage to the rollers, always remove jammed media gently.

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5. Remove the jammed media by pulling it straight out from above the transfer unit (fig. 9.11).

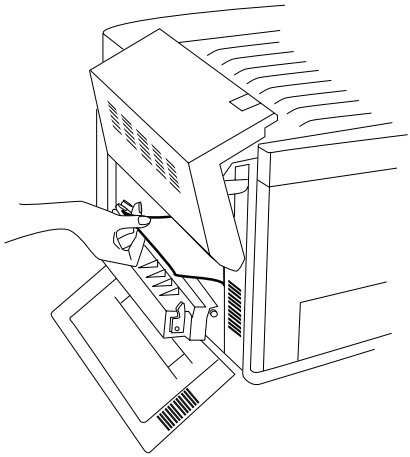

Fig. 9.11 *Remove the Jammed Media*

6. Close the transfer unit, and then the back cover.
7. Close the pressure release lever on the fuser unit.
8. Close the paper exit unit.

When the control panel message window displays `IDLE`, the printer is ready to print.

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If the Media Jam Message Stays On

1. If a jam message displays in the control panel message window, clear the jam using the appropriate procedure from the "Clearing Media Jams" section earlier in this chapter. If the message is still there, make sure cassettes have the correct size media, the size key slide on the back end of the cassette is set correctly, and all covers and doors are completely closed.

2. If the message displays when no jam is evident, make sure the printer is configured for the media size and type currently in the cassette. (See chapter 5, "Print Media and Daily Operations," or chapter 4, "Printer Configuration," to learn how to use the Paper and the Media keys.)

3. As a last resort, try turning the printer off and on (this will cause jobs to be lost).

Jam Recovery

The printer has automatic jam recovery, so if a media jam occurs, once you remove the jammed media, the printer reprints the jammed page and then continues with the print job, as long as the printer power has not been turned off. The Jam Recovery option is located in the Administration/Engine section of the printer configuration menu.

NOTE: Because jam recovery requires system memory, it can slow print jobs.

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Preventing Media Jams

Some printer problems are caused by improper handling of media or use of the wrong media and consumables. The following section provides information about correctly handling media and preventing jams.Several things you can do to reduce print media jamming in your printer are

- Set the printer for the print media type and size currently in the cassette. (See chapter 5, "Print Media and Daily Operations," or chapter 4, "Printer Configuration," to learn how to use the Tray Select and Media keys.)
- Use QMS supplied toner and developer, and use QMS-recommended print media (See appendix B, "Technical Specifications.")
- Make sure print media is not torn, folded, or wrinkled.
- Do not overfill the media cassette: it holds 250 sheets of paper, 50 transparencies, or label stock up to the upper-limit mark on the cassette.

  NOTE: If the printer is operating in a low-humidity environment, we recommend printing fewer than 20 consecutive transparencies to prevent jamming.
- If you have problems with double feeding, remove the paper from the cassette and fan the edges. The sheets may be sticking together. (However, do not fan transparencies; this can create electrostatic buildup that can cause jamming.)
- Store print media away from moisture and humidity. Moisture and humidity may cause media to turn up at the edges or wrinkles to occur. The recommended relative humidity during operation is 60%-70%.

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- Load media printing side up, top edge first. The printing side of media is indicated on the wrapping, so leave it in its wrapping until you are ready to load it.
- Keep the paper-feed rollers and the manual-feed belts clean. Dirty rollers and belts can draw media unevenly into the printer. See "Cleaning the Paper-Feed Roller and the Manual-Feed Belts" in chapter 6, "Consumables and Preventive Maintenance."

Preventing Envelope Jams

To prevent envelope jams

- Keep envelopes in their original box to protect them until they're used. Don't use damaged envelopes.
- Store envelopes in a low-humidity environment.
- Use only the envelope types specified in "Media Handling" in appendix B, "Technical Specifications." Don't use envelopes with windows.
- If you're using the optional envelope cassette, use it in the standard cassette slot (not the optional feeder), and don't place more than 30 envelopes in the cassette at once.

Internal Hard Disk Problems

If you experience unexplained or erratic problems with the internal hard disk, you may want to reformat the hard disk and reload the print system software. See chapter 8, "Printer Options," for information.

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Miscellaneous Problems: A Quick Check

If you have just installed your printer and are having problems, be sure you have correctly followed the setup steps outlined in chapter 2, "Initial Printer Setup," and chapter 3, "Connecting the Printer."

Then, check the following:

1. Is there a status message in the control panel window?

   If so, go to question 2.

   If not, check the following:

   - Is the power cord plugged into both the power outlet and the printer?
   - Are both power switches on?
   - Is the power outlet working?
   - Does the line voltage from the power outlet match the printer's power requirements? See appendix B, "Technical Specifications."

2. Can you print a status page? (This option is located in the Administration/Special Pages menu.)

   If so, go to question 3.

   If not, check the following:

   - Is the printer off line before you try to enter the menu? It should be.
   - Is the cassette empty? If it is out of media, the message `PUT` *`xxxxxx`* `PAPER IN` *`xxxxx`* `BIN` is displayed in the control panel message window and the Message LED is lit.

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- Is the toner or developer depleted?
- Are all printer doors and covers closed securely?
- Is there a media jam?

3. Is the printer receiving data from the computer? If the Data LED blinks after sending the file, the printer is receiving the data.

   If so, go to question 4.

   If not, check the following:

   - Are the interface cables securely fastened?
   - Is the printer on line? The Online LED should be lit.
   - Is your application set correctly? Are the communication parameters the same as those on your host and printer?
   - If you are using the serial interface, is the baud rate (speed of data transmission) of the printer, the computer, and your application the same?
   - If you still cannot identify the problem, contact your QMS vendor.

4. Is the printer printing codes or not printing at all when in ESP mode?

   - Reconfigure the port for the emulation in which you are trying to print. See chapter 4, “Printer Configuration,” for information on configuring the printer.
   - If ASCII or text files won’t print, make sure the ESP Default option (in the Administration/Emulations menu) is set to PCL5, the factory default.

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- If you continue to have problems with the ESP mode selecting printer emulation, contact your QMS vendor.

IBM PC and Compatible Computer Checklist

If you are experiencing problems with printing from a PC (not related to print quality), check the following:

- Does your application setup match the printer interface settings?
- Have you set up your printer port at the system level (DOS) and installed a color PostScript driver within your application? (Refer to your DOS, Windows, and application documentation.)
- Do you need an end-of-job for the previous job?
- If you are using a serial interface, are you experiencing a protocol problem? Set the printer to DTR/DSR protocol. If that does not work, check your serial interface cable. You may also want to try setting the printer to XON/XOFF protocol.
- Does your application support color PostScript Level 2? (Check the application manual. If your application supports color PostScript Level 1 but not Level 2, try setting the printer to Level 1 in the Administration/ Emulations/PostScript/Emulation Level menu.)

Apple Macintosh Checklist

If you are experiencing problems with printing from a Macintosh (not related to print quality), check the following:

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- Is the printer properly connected via LocalTalk-type cable and transformer boxes? (See chapter 3, "Connecting the Printer," for information.)
- Is LaserWriter (and Laser Prep, if you are using LaserWriter 6.0.*x* or later) installed in your System Folder?
- In the Chooser, have you selected the LaserWriter icon and highlighted the correct printer?
- Is AppleTalk active in the Chooser dialog box?
- Are the screen fonts installed?
- Is your application compatible with color PostScript Level 2? (Check the application manual. If your application supports color PostScript Level 1 but not Level 2, try setting the printer to Level 1 in the Administration/ Emulations/PostScript/Emulation Level menu.)

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Mechanical Problems

Control Panel Selections Don't Take Effect

- Make sure you're saving menu selections before exiting the menu. (See "Saving Configuration Selections" in chapter 4, "Printer Configuration.")
- Some configuration selections do not take effect until the printer has been rebooted. Look in chapter 4, "Printer Configuration," to see if the selection you are making requires a reboot.

Data LED Stays Lit

After the printer warms up, if the Data LED stays on, two problems may exist.

1. If you are downloading additional fonts, too many can overload the printer's memory causing the printer to reset and lose information previously downloaded to RAM. Make sure you have enough printer memory for the additional fonts. Additional memory (RAM) is available and easily installed. Contact your QMS vendor for information on RAM upgrades. See chapter 8, "Printer Options."
2. On an AppleTalk network, Macintosh computers sometimes interfere with each other. If this happens often, check all the Macintosh computers on the network to make sure they are using the same version of LaserWriter and Laser Prep. If neither of these files is the problem, contact your QMS vendor.

No Start-up Page

If no start-up page prints, check the following:

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1. Is the printer on line?
2. Has the start-up page been disabled? Check the Do Start Page option in the Administration/Startup Options menu to make sure the start-up page is on. If the start-up page is turned on, go to step 3.
3. Turn the printer off, then back on. It takes approximately 4 minutes for the printer to warm up from a cold start or less than a minute from a warm start. Be sure you wait long enough for a start-up page to print before suspecting a problem.
4. Check to be sure the media cassette is in place and secure.
5. Check for a media jam. See "Clearing Media Jams" earlier in this chapter for details.
6. Make sure all toner and developer cartridges are installed and not depleted.
7. Make sure the fuser oil is not depleted.

If you have not solved the problem and no status message displays, call your QMS vendor for help.

Printer Resets

1. Different versions of LaserWriter and Laser Prep being used on a network can cause printer reinitialization.
2. Downloading too many fonts can overload the printer's memory and cause the printer to reset to default. Additional memory (RAM) is available and easily installed. Contact your QMS vendor for information on RAM upgrades. See chapter 8, "Printer Options."
3. If the printer resets in other circumstances, call your QMS vendor for service.

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Printer Locks Up

If the INITIALIZING message remains in the message window, and you are not be able to enter the Configuration menu or print even after you turn the printer off and on again, the printer has probably been incorrectly configured. You can reset to factory defaults by simultaneously holding down the Select and Online/Offline key (for about 10 seconds) while turning the printer off and on again. The reset process takes several minutes to complete.

Blank Pages

1. Check for a status message to be sure the printer is not out of toner or developer.
2. Be sure you removed the sealing tapes on newly installed toner and developer cartridges.
3. If no toner cartridges are empty and sealing tapes have been removed, toner may have become packed down. Take the toner cartridges out and gently shake them horizontally to loosen the toner. Then, reinstall the cartridges, making sure the cartridges go into the correct color slots. (See "Replacing the Toner Cartridge" in chapter 6 for details.)
4. If these solutions do not work, contact your QMS vendor.

Not All Pages Print

1. Check your cable. You could have the wrong kind of cable, or your printer may not be configured for the correct cable and port.
2. Make sure no one pressed the Cancel key while your job was printing.
3. Check the control panel message window to see if the media cassette is empty.

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4. Increase the emulation timeout (for HP PCL and HP-GL files) or the PS wait timeout (for PostScript files).

5. If you are using a PC, make sure that the **mode** statement in your AUTOEXEC.BAT file ends in a **p** so that print jobs are sent until the printer accepts them:

```
mode lpt1:,,p
```

6. Send an end-of-job in case a previous job lacked this command.

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Print Quality Problems

Generally Poor Print Quality

- Make sure the printer is set for the type of media (paper, transparency film, or thick stock) you are printing on: use the Media key on the printer's control panel to tell the printer whether paper or transparencies have been loaded in the currently selected cassette. See chapter 4, "Printer Configuration," for information on using the control panel.
- Make sure the media is in good shape and meets all the specifications in appendix B, "Technical Specifications."
- Remove the toner cartridges and shake them horizontally. Toner can settle, and this procedure redistributes the toner. Reinstall the cartridges in the printer and try to print again.
- If the print appears too light or dark, change the print density dial settings for the toner cartridges as necessary (see "Adjusting Print Density" in chapter 5 for details). Then, try reprinting.

  NOTE: Changing the print density affects the resident color management system and should be done only as a last step to improve print quality.

See chapter 7, "Optimizing Color Output," for more information on optimizing print quality.

Specific Print Quality Problems

The following section addresses specific print quality problems. Try the solutions in the sequence given. If these do not solve the problem, place a service call.

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600 dpi Jobs Print at 300 dpi

- Make sure the printer is configured for 600 dpi.

  See chapter 4, “Printer Configuration,” for information.

- Make sure you have enough RAM installed for the job you are trying to print.

  If your printer has 12 MB RAM, color documents print in 300 dpi. Monochrome documents can be printed in 600 dpi if you configure the printer for monochrome printing, either through your application (if its driver, like the QMS-provided Windows and Macintosh drivers, supports this option) or through the printer control panel. You can print color *and* monochrome documents in 600 dpi if you install additional RAM in the printer. See appendix B, “Technical Specifications,” for a chart showing RAM requirements for different page sizes and numbers of colors.

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White or Light Lines

- Remove each toner cartridge, shake it as you do before installing a new cartridge to redistribute toner, and then reinstall the cartridge.
- Install a new cartridge if necessary.

Light Image (Entire Page)

- Increase the print density for any color(s) used on the page (see "Adjusting Print Density" in chapter 5 for details).
- Remove each toner cartridge for a color used on that page, and shake it as you do before installing a new cartridge. Then, reinstall the cartridge.
- Install a new toner cartridge if necessary. (See "Replacing a Toner Cartridge" in chapter 6 for details.)

Light Image on the Left or Right Side of the Page (all colors)

- Make sure the printer is level (maximum 1° slant).

Dark Image (Entire Page)

- Decrease the print density for any color(s) used on the page (see "Adjusting Print Density" in chapter 5 for details).
- Install a new cartridge if necessary. (See "Replacing a Toner Cartridge" in chapter 6, "Consumables and Preventative Maintenance," for details.) The old cartridge may be defective, releasing too much toner.

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Blurry Images, Scratches, or Missing Dots

- Make sure the media is in good shape and meets all the specifications in the "Media Handling" section of Appendix B, "Technical Specifications."
- Check for a status message on the control panel. The toner or developer may be low. Replace cartridges as necessary.
- Make sure the paper path is clean. See the "Preventative Maintenance" section in chapter 6, "Consumables and Preventative Maintenance," for details on cleaning the charger unit, various rollers, and plates.
- Check the OPC belt for dirt and scratches. Replace the OPC belt cartridge if necessary. (See the "Replacing the OPC Belt Cartridge" section in chapter 6.)
- If whole blocks or portions of the page are missing, there may be a mechanical problem; contact your QMS vendor.

Image is Not Centered on the Page

- Make sure you aren't printing outside the printer's imageable region for the media size you're using (see "Media Handling" in appendix B, "Technical Specifications"). You may need to change to a larger size media, or adjust the margin(s) through your application.

  If images are not printing within the imageable area for the page size you're using, the printer may be out of alignment. See "The Status Pages" in chapter 5, "Print Media and Daily Operations," for information on checking printer alignment.

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Color Jobs (or Portions of Jobs) Print in Monochrome

- Make sure you have enough RAM installed for the job you are trying to print.

  See appendix B, "Technical Specifications," for a chart showing RAM requirements for different page sizes and numbers of colors.

- If you're printing legal-sized pages, note that there are different imageable areas for black and color printing. See "Media Handling" section of Appendix B, "Technical Specifications."

Colors Not Registering Properly

- Check to make sure the printer is on a hard, level surface.
- Check for damage to the OPC belt cartridge. Replace it if necessary.

Smudges on the Back of Pages

- Make sure the size key on the media cassette is set to the right size for each job. Smudges can occur if the wrong size was selected on the previous job causing the image to print off the side of the page onto the transfer roller. If this happens, run a few more pages through the printer to clean off the remaining toner.

Dark Vertical Lines

- Check the OPC belt cartridge. Something may be caught under the cleaning blade or the cartridge may need to be replaced. Install a new OPC belt cartridge.

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Sharp Horizontal Lines (across the feed direction)

- Place a service call.

Partial Images or Image Too Small

- Check the imageable regions for the size media you are using (see "Media Handling" section of Appendix B, "Technical Specifications"). Are you trying to print outside of the imageable region of the page? If so, change to a larger size media, or adjust the margin(s) through your application.
- The charger unit or various roller and plates may be dirty. See "Preventative Maintenance" in chapter 6 for instructions on how to clean these parts.

Smearing on Transparencies

- Make sure the printer is set for transparency printing: use the Media key on the printer's control panel to tell the printer transparencies are in the currently selected cassette. See chapter 4, "Printer Configuration," for information on using the control panel.
- Make sure the transparency stock is in good shape and meets all the specifications in the "Media Handling" section of appendix B, "Technical Specifications." Try printing a few transparencies at a time and giving the sheets a chance to cool between prints.
- Make sure the transparencies are loaded print side up and the cassette is not overloaded (50 sheets or less, not over the upper-limit mark inside the cassette).
- Check the print density dials for the toner cartridges. Try setting the dials in the middle (where the dot appears).

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Placing a Service Call

If you have a problem you cannot resolve, contact your QMS vendor. Your vendor is best equipped to immediately handle problem you may encounter. If you cannot get service from your vendor, see appendix A, “QMS Customer Support.”

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Appendix A

QMS Customer Support

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QMS Customer Support

Several sources of help and information are available, depending on the type of help you need:

1. Your QMS printer vendor

   Your local vendor (the one from whom you bought the printer) may be best equipped to help you. Your vendor has specially trained service technicians available to answer questions, and the equipment to analyze your printer problems.

2. Your application vendor

   Sometimes "printing" problems have more to do with the application being used than with the printer. In this case, the application manufacturer is the best source of help.

3. Q-FAX

   Q-FAX, a QMS information retrieval service, provides application notes, technical support notes on common printing problems, and information about printer specifications, options, accessories, consumables, and prices.

   In the United States and Canada, call (800) 633-7213 to reach Q-FAX. In all other countries, call (334) 633-3850. Have your fax number handy when you call (or place the call from your fax machine's handset).

   You can choose to have either a directory (a list of currently available documents on a particular topic) or a specific document sent to you. The first time you call, request the directory (press 2 on your phone or fax keypad when prompted). Then call back to request specific documents. You can order up to three documents per call.

4. The QMS Corporate Bulletin Board System (BBS)

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The bulletin board contains technical support notes, application notes, drivers, patches, and utilities, and you may leave technical questions not requiring an immediate response on electronic mail for the Sysop (System Operator). The bulletin board [(334) 633-3632] operates at 1200, 2400, 9600, and 14400 baud, 8 data bits, no parity, 1 stop bit, with XMODEM, YMODEM, and ZMODEM capabilities. Contact QMS Customer Technical Assurance for more information about the bulletin board.

5. CompuServe

   Through CompuServe, you can ask general (non-technical) questions, share information with other users, and access printing information and programs. When you use CompuServe, type the following command to go directly to the forum where QMS is located:

   - `go qmsprint`

   The QMS library section contains application notes, printer drivers, utilities, technical information, and announcement files.

6. The Internet

   The QMS server provides access to technical reports, new product announcements, a trade show schedule, and other general information about QMS. You can access the QMS server via any of the web viewers available to Internet users. If you don't have access to a web viewer, we recommend the NCSA Mosaic web viewer (Mosaic is at ftp.ncsa.uiuc.edu).The QMS home page is at http://www.qms.com/. The QMS ftp resource is ftp.qms.com.

7. QMS Customer Technical Assurance

   QMS Customer Technical Assurance is available in the US from 8 a.m. to 5 p.m., Central Standard Time, at (334) 633-4500. You can also fax questions to CTA at (334)

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633-3716. Please indicate whether you would like a faxed or a phoned reply.

If you call for assistance, have the following information ready so our technicians can help you more quickly:

- Your phone number, fax number, and shipping address
- A description of the problem
- The printer model and serial number
- The type of host computer you are using
- The type and version of operating system you are using
- The interface you are using, and, if serial, the protocol
- The application and version you are using
- The printer language you are using
- Your printer firmware version (listed on the status and start-up pages)

If after consultation with CTA, you need to return the unit for repairs or warranty work, please be sure to get an RMA (Return Merchandise Authorization) number, since QMS cannot accept warranty work without this number. CTA can connect you with Customer Service to get this number.

QMS National Service

For information on service and maintenance of QMS and other manufacturers' printers, call (800) 762-8894. For information about on-site service and depot repair, call (800) 858-1597. For information on spare parts, call (334) 633-4300 ext. 2530.

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Melbourne 61 (3) 899 5777
Sydney 61 (2) 901 3235
Tokyo (81) (3) 3437-4030

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Appendix B

Technical Specifications

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Print Engine

Print Method Cyan, magenta, yellow, and black electrophotographic recording with semiconductor laser. Dry toner, image transfer to print media.

Resolution The table below shows minimum RAM requirements for different page sizes and numbers of colors (shaded areas indicate printing capabilities with the standard 12 MB RAM):

Page Size	Dots per Inch	Minimum RAM (Monochrome)	Minimum RAM (Four-color)
Letter	300	12 MB	12 MB
	600	12 MB	24 MB
Legal*	300	12 MB	16 MB
	600	16 MB	28 MB
A4	300	12 MB	12 MB
	600	12 MB	24 MB
Executive	300	12 MB	12 MB
	600	12 MB	24 MB
Envelopes (DL and Com 10)	300	12 MB	12MB
	600	12 MB	20 MB

*Although the monochrome imageable area for legal-sized pages is 8.11" x 13.61" (205.90 mm x 345.60 mm), the full-color imageable region for this size is limited to 8.11" x 11.7" (205.90 mm x 297.18 mm).

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Print Speed	12 pages per minute monochrome 6 pages per minute 2- or 3-color 3 pages per minute 4-color (Assuming the use of letter or A4 size with 30% or less toner coverage.)
Recommended Duty Cycle	5,000 color prints per month 20,000 monochrome prints per month
Warm-Up Time	250 sec. maximum; 180 sec. average
Noise Level	Not more than 58 dB (A)
Engine Switches	Main power switch (back of printer) Remote power switch (front of printer)
Dimensions	20.5" W x 22.3" D x 14.6" H 520 mm W x 565 mm D x 370 mm H
Weight	Approximately 106 lbs (48 kg) without consumables or options installed

Controller

Type	Intel 80960CF RISC-based controller operating at 33 MHz
Fonts	See chapter 7, “Optimizing Color Output,” for a list of the resident fonts.
Emulations	PostScript Level 2 PostScript Level 1 HP-GL (7470A/7475A/7550A/ColorPro) HP PCL 5C (HP XL 300) Hexdump Lineprinter Optional emulations
Interfaces	LocalTalk, parallel, serial, SCSI, optional network interface See “Cable Pinouts,” later in this chapter, for more information.

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SCSI	Supports optional SCSI disks, up to a 512 MB.
Standard RAM	12 or 24 MB RAM (upgradable to 64 MB)

Internal Hard Disk

Size	80 MB IDE drive (Upgradeable to 512 MB.)

Electrical Requirements

Power Requirements	120 V ±10%
Frequency	60 Hz (± 2Hz)
Power Consumption	**Standby** 1000 W max.; 150 W ave. **Operation** 1000 W max.; 250 W ave. **Energy Saver Mode*** less than 45* W

*Available only on Energy Star models of the printer when Energy Saver mode is enabled. See chapter 4, "Printer Configuration," for more information on Energy Saver mode.

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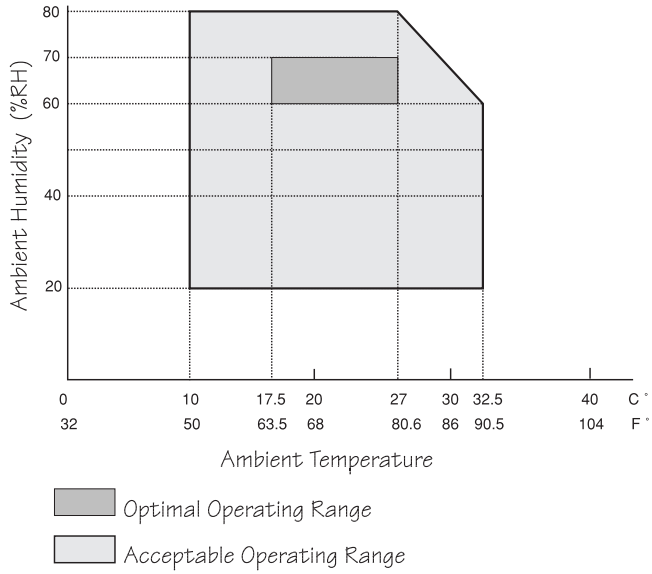
Environmental Requirements



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Media Handling

Media Sizes*	Size	Inches	Millimeters
	Letter	8.50 x 11.00	215.90 x 279.40
	Legal	8.50 x 14.00	215.90 x 355.60
	A4	8.27 x 11.69	210.00 x 297.00
	Executive	7.25 x 10.50	185.00 x 267.00
	Com 10	9.50 x 4.125	241.30 x 104.78
	DL	8.66 x 4.33	220.00 x 110.00

Imageable Regions*	Size	Inches	Millimeters
	Letter	8.11 x 10.61	205.90 x 269.40
	Legal 1/C	8.11 x 13.61	205.90 x 345.60
	Legal 4/C	8.11 x 11.7	205.90 x 297.18
	A4	7.87 x 11.30	200.00 x 287.00
	Executive	6.89 x 10.12	175.00 x 257.00
	Com 10	9.19 x 3.89	233.30 x 98.78
	DL	8.35 x 4.09	212.00 x 104.00

Margins*	Top	Bottom	Left	Right
Letter	0.2"	0.2"	0.2"	0.2"
Legal 1-Color	0.2"	0.2"	0.2"	0.2"
Legal 4-Color	0.2"	2.1"	0.2"	0.2"
A4	5 mm	5 mm	5 mm	5 mm
Executive	5 mm	5 mm	5 mm	5 mm
Com 10	0.12"	0.12"	0.16"	0.16"
DL	3 mm	3 mm	4 mm	4 mm

*All measurements are accurate within 0.02"/0.5 mm. See chapter 5, “Print Media and Daily Operations,” for more information on media.

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Print Media Types, Weights, and Recommended Brands		
Media Type	**Weight**	**Brand**
Plain Paper	60 to 90 g/m^2 16 to 24 lb	Xerox 4024
Laser Paper	60 to 90 g/m^2 16 to 24 lb	Hammermill Laser Print (White)
Thick Stock (manual-feed only)	up to 163 g/m^2 up to 43 lb	N/A
Transparencies	138 to 146 g/m^2 36.7 to 38.8 lb	3M PP2500, Xerox 3R 2780, Xerox 3R 3117
Labels	156 to 170 g/m^2 41.5 to 45.2 lb	Avery 5260
Envelopes	90 g/m^2 24 lb	CraftMaster, Velpa, Sphinx White Wove Sub 24, Auto Fil #1914

NOTE: Hammermill Paper offers free samples of its laser paper in varying weights. In the US, call toll free (800) 242-2148.

Media Storage 63.5° to 80.6° Fahrenheit
(17.5° to 27° Celsius)
60% to 70% relative humidity
Media should be stored in its original wrapper, on a flat surface, away from dust and sunlight

Paper Cassette Capacity 250 sheets of paper
50 transparencies

Output Tray Capacity 150 sheets

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Consumables

Your QMS vendor can provide the consumables listed below for your color printer. In the US, you can also call (800) 777-7782 to order consumables. Keep in mind that consumables can have an effect on your printer warranty. See "How Consumables Affect Your Warranty" later in this appendix for details.

The industry standard for toner, developer, and OPC belt measurement is quoted at 5% coverage (letter- or A4-size media).

Toner Cartridges	Black	4,000 pages
	Cyan	3,000 pages
	Magenta	3,000 pages
	Yellow	3,000 pages
Developer Cartridges	Black	30,000 pages
	Cyan	15,000 pages
	Magenta	15,000 pages
	Yellow	15,000 pages
Oil Bottle and Cleaning Pad	The first oil bottle and cleaning pad change will last approximately 1,500 pages. After that, they will last approximately 3,000 pages.	
OPC Belt Cartridge	50,000 planes	
Waste Toner Pack	6,000 planes per pack (sold in 5-pack sets for a total of 30,000 planes per set)	
NOTE:	Measurement of waste-toner pack and OPC life is done in planes rather than pages. A plane is a pass of the OPC belt for one color. For example, a one-color page makes one pass (one plane) and a two-color page makes two passes (two planes).	

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Options

These are the options available for this printer at the time this manual went to press. Contact your QMS vendor for a complete, updated list, or (in the US) call QMS at (800) 777-7782.

250-sheet Sheet Feeder	Comes with a media cassette, which is interchangeable with the standard cassette.
30-envelope Envelope Cassette	Can be used in the standard media-cassette slot or the optional sheet feeder.
Emulations	LN03 Plus CCITT
Font Cards	HP ProCollection

System Administrator Security Card

Dataproducts Short-line Conversion Kit

External Hard Disk

Internal Hard Disk

Kanji Typeface Hard Disk Kit

Ethernet Interface	LAN Manager/LAN Server DECnet TCP/IP NetWare EtherTalk
Token-Ring Interface	LAN Manager/LAN Server TCP/IP NetWare
Optional Documentation	QMS Crown Document Option Commands QMS Crown Network Notes HP PCL 5 Emulation Technical Reference QMS Crown Technical Reference

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SIMMs

Memory Upgrade Kit	4 MB 8 MB 16 MB 32 MB
Electrical	5V ± 10% Fast page mode
	t_{ras} = 80 ns. t_{cas} = 20 ns. t_{rac} = 80 ns. t_{cac} = 20 ns.
Mechanical	72-pin industry standard package; 1" high; tin-plated contacts
Size	4 MB (1M x 32) 8 MB (2M x 32) 16 MB (4M x 32) 32 MB (8M x 32)

You can get information on which SIMMs and hard disks are compatible with your printer from Q-FAX. See appendix A, "QMS Customer Support," for information on using Q-FAX. Ask for Q-FAX document 6502, "QMS-tested SIMMs and Hard Disks."

Warranty Considerations

You should read your printer warranty carefully and be sure to store it in a safe place. Various factors can affect a printer's warranty. Two important ones are consumables and electrostatic discharge.

How Consumables Affect Your Warranty

The use of non-QMS consumables and/or accessories alone doesn't affect either your warranty or any maintenance contract you may have purchased. However, if a QMS printer failure or damage is found to be directly attributable to the use of non-QMS

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consumables and/or accessories, QMS will not repair the printer free-of-charge. In this case, standard time and material charges will be applied to service your printer for that particular failure or damage. QMS recommends that you use only quality QMS consumables and accessories to support your printer. To order QMS accessories, in the US call (800) 777-7782. In all other countries, check appendix A, "QMS Customer Support," for the QMS office closest to you.

How Electrostatic Discharge Affects Your Warranty

Incidental and consequential damages caused by not discharging electrostatic buildup can affect your printer warranty. Electrostatic discharge can destroy circuit boards, such as a SIMM or your printer's controller board. To prevent this, use an antistatic wristband when handling printer circuit boards. To use it, attach one end of it to your wrist and the other end to any convenient electrical ground (for example, the bare metal chassis of equipment, as on the back of a computer, that is plugged in but turned off). Never attach the wrist strap to any piece of equipment with an electrical current present. Turn off all power switches first. Plastic, rubber, wood, painted metal surfaces, and telephones are not acceptable grounding points. The printer isn't an acceptable grounding point either because it must be unplugged before you perform this task.

If you don't have an anti-static wrist strap, discharge your body's static electric charge by touching a grounded surface before you handle any printer boards or components and before removing the tray assembly cover. Redischarge your body each time after walking around and before touching the printer again.

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Cable Pinouts

LocalTalk

The table below gives the correct pinouts for the printer end of the 8-pin LocalTalk cable used to connect a computer and printer:

Pinout: LocalTalk	**Pin No.**	**Name**
	3	TxD-
	4	GND
	5	RxD-
	6	TxD+
	8	RxD+

Macintosh to Serial

The table below gives the correct pinouts for a cable connecting the Macintosh printer or modem port to the printer serial port. (This type of cable would be required to reinstall printer system software from a Macintosh if printer software is not functioning.)

Pinout: Macintosh to Serial	**Host Pin No.**	**Serial Pin No.**	**Signal**	**Direction**
	1	5	RTS	From Mac
	2	4	CTS	To Mac
	3	3	TxD	From Mac
	4,8*	7	GND	
	5	2	RxD	To Mac
	6	-	NC	
	7	-	NC	

*Pins 4 and 8 must be connected at DIN-8

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Serial

The table below gives the correct pinouts for the printer end of the 25-pin serial cable used to connect a computer and printer:

Pinout: Serial	**Pin No.**	**Name**
	2	TxD
	3	RxD
	4	RTS (optional)
	5	CTS
	6	DSR (optional)
	7	GND
	20	DTR (optional)

IBM PC/XT, PC/AT, and Compatible Computers

Pinout: IBM PC/XT	**Printer DB-25S**	**IBM PC/XT DB-25P**
	1	1
	2	3
	3	2
	4	5
	5	4
	20	6+8
	6+8	20
	7	7

Pinout: IBM PC/AT	**Printer DB-25S**	**IBM PC/AT DB-9P**
	1	1
	2	2
	3	3
	7	5
	20	6+8

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Centronics Parallel

The following table describes the Centronics parallel interface cable that can be used with your printer. (See "Notes to the Centronics Parallel Cable Pinouts Table" on the next page for more information.)

Pinout: Centronics Parallel	**Signal Pin No.**	**Return Pin No.**	**Signal**	**Direction**
	1	19	STROBE-	In
	2	20	DATA 1	In
	3	21	DATA 2	In
	4	22	DATA 3	In
	5	23	DATA 4	In
	6	24	DATA 5	In
	7	25	DATA 6	In
	8	26	DATA 7	In
	9	27	DATA 8	In
	10	28	ACKNLG-	Out
	11	29	BUSY+	Out
	12	30	PE+	Out
	13	-	SELECT	Out
	16	-	GND	-
	18	-	VCC TEST	-
	19-30	-	GND	-
	31	-	IPRIME	In
	32	-	FAULT-	Out
	33	-	GND	-

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Notes to the Centronics Parallel Cable Pinouts Table

Direction refers to the direction of signal flow as viewed from the printer.

Return denotes “twisted-pair return” and is to be connected at signal-ground level. When wiring the interface, be sure to use a twisted-pair cable for each signal and always complete connection on the return side. To prevent noise effectively, these cables should be shielded and connected to the chassis of the system unit and printer, respectively.

All interface conditions are based on TTL level. Both the rise and fall times of each signal must be less than 0.2 microseconds.

The cable must have an overall braided shield, Belden 8345 or equivalent.

Connectors must have shielded housings. The overall shield must be bonded to the shielded housings at both ends of the cable.

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1284 Parallel

The Centronics parallel interface supports two modes for 1284 bi-directional communication, nibble mode and byte mode:

In nibble mode, bi-directional communication between the printer and the host is done in nibbles (four bits) with the low order nibble sent first. A transfer of two nibbles is required for each byte of information. In byte mode, bi-directional communication between the printer and the host is done in bytes. The byte mode may be used by the host device in a DMA (Direct Memory Access) mode for more efficient operation.

When byte transfer is complete and there is no more data to transmit, the host may do one of the following:

- terminate and return to the compatibility mode.
- stay in the HostBusy, Data Not Available phase.
- set HostBusy Low, putting the interface into the idle phase.

If there is additional data, the host may do one of the following:

- set HostBusy Low, indicating that the host can accept additional data.
- stay in the HostBusy, Data Not Available phase.
- terminate and return to the compatibility mode.

Check your host documentation to see if the host is 1284 compatible.

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Dataproducts Parallel

The following table describes the Dataproducts parallel interface cable that can be used with your printer.

Pinout: Dataproducts Parallel	**Signal Pin No.**	**Return Pin No.**	**Signal Description**	**Direction**
	1	2	Data Bit 3	In
	11	-	Parity Error (grounded)	
	12	-	+5V (limited by 1K ohm resistor)	Out
	19	3	Data Bit 1	In
	20	4	Data Bit 2	In
	21	5	Online	Out
	22	6	Ready	Out
	23	7	Demand	Out
	28	44	Data Bit 8	In
	30	14	Paper Instruction	In
	34	18	Data Bit 5	In
	36	35	Data Bit 7	In
	38	37	Strobe	In
	39	-	Logic Ground	
	41	40	Data Bit 4	In
	43	42	Data Bit 6	In
	45, 46	-	Interface Verify	

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Appendix C

Notices

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FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

To comply with part 15 of FCC rules, shielded interface cables must be used.

WARNING! **To prevent electrical shock, do not remove any covers from your printer unless you are experienced in working with circuit boards and are following instructions for procedures described in QMS documentation.**

ACHTUNG! **Um einen Elektroschock zu vermeiden, sollte die Drucker-abdeckung niemals von Unbefugten geöffnet werden. In jedem Fall müssen die diesbezüglichen Hinweise des Handbuches genau beachtet werden!**

CAUTION: Any modifications or changes to this product not expressly approved in writing by the manufacturer responsible for compliance to Federal Regulations could void the user's authority to operate this product within the Laws and Regulations of the Federal Communications Commission.

Canadian Users

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques (de la classe A) prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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Vfg 1046/1984 Conformity Statement

Hierdurch bescheinigen wir, daß dieses Produkt in Übereinstimmung mit Postordnung 1046/1984 ist und RFI unterdrückt ist. Die Geschäftslage und der Verkauf diese Geräte auszuprobieren, mit der Übereinstimmung und der Regierung zu bestätigen, wurde der Deutschen Bundespost gegeben.

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß Laser Printer model *magicolor* LX in Übereinstimmung mit den Bestimmungen der Vfg 1046/1984 funkentstört ist. Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

QMS, Inc., Mobile, AL

Declaration of Manufacturer/Importer

We hereby certify that the laser printer model *magicolor* LX is in compliance with Vfg 1046/1984 and is RFI suppressed.

The marketing and sale of this equipment was reported to the German Postal Service.

The right to retest this equipment to verify compliance with the regulation was given to the German Postal Service.

QMS, Inc., Mobile, AL

Electronics Emissions

Your printer complies with the Electronics Emissions Requirements of the German Federal Minister for Postal and Telecommunication Technology regulation:

Vfg. 1046/1984

Your printer complies with the Electronics Emissions Requirements of the European Economic Council directive:

82/499/EEC

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Laser Safety

This printer is certified as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

Proprietary Statement

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Colophon

This manual was written with WordPerfect, illustrated with Adobe Illustrator and Micrografx Designer, and formatted with Ventura Publisher. The manual was printed in camera-ready form on a QMS printer.

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Appendix D

Additional Technical Information

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Introduction

This appendix provides additional technical information on how your printer works and memory management.

How Your Printer Works

Your laser printer works using a combination of a mechanical and an electrical process. The whole process comes down to five stages in which mechanical parts move media (paper or transparencies) through the printer and progressively stronger electrical charges transfer toner from area to area as it forms the image. See figure D.1 for an overview of the mechanical part of the interior of your printer.

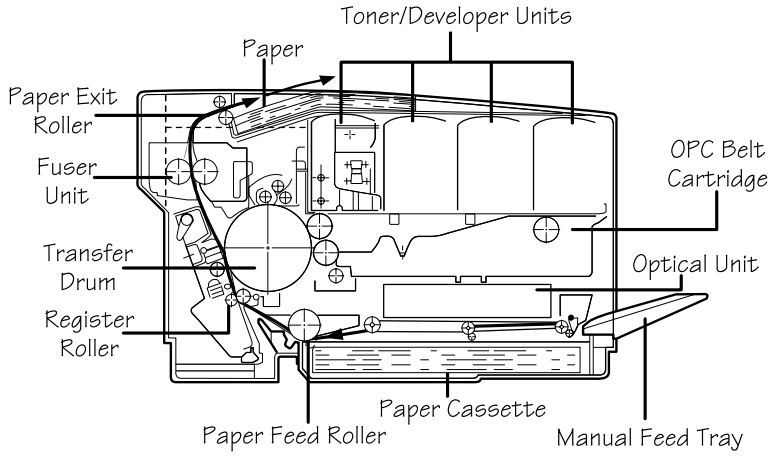

Fig. D.1 *Interior View of the Printer*

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1. A precharger unit puts an even charge across the OPC (Organic Photoconductor) belt. Think of it as preparing a surface for painting.

2. When you send an image file, the QMS controller uses that information to control when the laser beam in the optical unit turns on and off as it scans the OPC belt. When the beam is on, it discharges sections of the belt forming an image.

3. Next, the belt passes under the developer/toner unit, which opens, and toner is electrically attracted to the discharged areas. (In color printing, each color is individually applied during a separate pass of the belt: yellow first, followed by magenta, cyan, and black.)

4. The belt carries the toner image to the transfer drum, where a slightly stronger charge attracts and stores the toner until all colors are processed. Once the full image is collected, the drum turns toward the transfer roller, which has an even stronger attracting charge. However, just before the toner can switch to the transfer roller, media passes between the drum and roller, so the toner lands on the media instead.

5. Rollers pull the media up through the fuser unit, where heat and pressure set the toner, and the final copy comes out into the top cover.

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Memory

The memory requirements of the printer are dictated by the applications that you run. Of the printer's memory, 9 MB are divided among blocks or "memory clients," each dedicated to a specific purpose. Added or extra printer memory (if any) can be redistributed among the memory clients where it can best serve your specific printing needs. This appendix explains the different memory clients and what happens if you increase or decrease their memory allocations. See the glossary for definitions of unfamiliar memory terms.

Don't feel compelled to reconfigure your printer's memory just because you have the ability to: printer memory is configured at the factory to provide optimal performance in most printing environments. Remember that the engine's maximum speed is about 8 pages per minute for a letter- or A4-size, monochrome page, no matter how much memory is installed.

NOTE: To reset all factory defaults in the Configuration menu, use the restore defaults option in the Administration/Miscellaneous menu. You can also reset all factory defaults by simultaneously holding down the Select and Online/Offline keys (for about 10 seconds) while turning the printer off and on again. The reset process takes several minutes to complete.

Memory Management

There is no single correct way for everyone to allocate printer memory. The factory default configuration might be the best for your environment. Or, for example, if you use a large number of PostScript fonts of various point sizes, you might want to increase the amount of memory allocated to the memory client dedicated to

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PostScript fonts. Each of your printer's features requires a minimum amount of memory. If you use a feature, you must allocate enough memory to the client that controls it, but if there are features you do not use, you can move excess memory from unused features to other clients that need additional memory.

To determine if and how you need to reallocate printer memory, read the descriptions of the different memory clients in the sections that follow.

The Memory Clients

The memory clients can be set up from the Administration/Memory menu of the printer's Configuration menu. Each time you make changes in the Memory menu, print a status page (in the Administration/Special Pages menu) to confirm the memory reallocation. When you allocate memory to a specific client through the control panel, it is allocated in kilobytes (KB). The sizes listed on the status page are in bytes, so you must divide the numbers on the status page by 1024 to get the equivalent number of kilobytes entered through the control panel.

NOTE: The value for each memory client must be evenly divisible by 4 KB: if a value is entered that is not evenly divisible by 4 KB, it is automatically converted to the next lower value that is divisible by 4 KB. For example, if you enter 102 KB, the actual value is lowered to 100 KB (assuming there is enough memory available to allocate to this client). The amount shown on the status page will then be 102,400 (100 x 1024).

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Frame Buffer

Listed as K Mem Framebuff in the Administration/Memory menu, the frame buffer memory client holds rasterized (bitmapped) images of page faces that are ready to be sent to the physical print engine. Your QMS printer comes configured with enough frame buffer memory for a single four-color 300 dpi legal-size page or a single four-color 600 dpi letter-size page in the largest media size supported.

PostScript Heap

Listed as K Mem for PSHeap in the Administration/Memory menu and elsewhere as PostScript VM and Virtual Memory, this client holds downloaded fonts, PostScript operators, and forms.

Inefficiently coded PostScript jobs can consume an infinite amount of virtual memory or leave objects in the PostScript heap after the print jobs are completed, leading to virtual memory errors. If not enough memory is allocated to the PostScript heap, the job cannot print.

Increasing the memory allocated to this client allows more complex jobs to print and increases the number of fonts that can be downloaded to virtual memory. If you receive a virtual memory error when attempting to print a job or download a font, this client should be increased in small increments until the error message goes away.

Spool Buffers

Listed as K Mem for Spool in the Administration/Memory menu and as Host Input on the status page, this memory client stores incoming data from all the interfaces until the physical print engine can print the job. When enough memory is allocated to this client,

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the host becomes free more quickly, and the number of jobs that the printer can accept simultaneously is increased. So increasing this client can be beneficial in reducing network traffic, but throughput speed is not necessarily increased. If available, a hard drive can supplement this client with additional memory needed for spooling. See "Hard Disk Management," later in this appendix.

PostScript Font Cache

Listed as K Mem PS Fonts in the Administration/Memory menu and also as Font Cache, this memory client stores bitmapped representations of previously rasterized PostScript fonts, which reduces the number of times a font must be converted from outline form to bitmap form, so that pages print faster.

As the font cache memory fills, the printer erases bitmapped characters to make room for new characters. By increasing the memory allocated to this client, the printer can store more characters and spend less time erasing and replacing characters in the cache.

Normally, you do not need to change this memory client unless you use a large number of fonts at different point sizes. There is no specific formula to use in figuring the amount of memory required by the font cache, but after a certain point, large font caches cause printing to take longer than smaller font caches because of the search time through the cache. The recommended font cache size is 128-256 KB, but you should experiment to see what font cache size works best for you.

Emulation

Listed as K Mem Emulation in the Administration/Memory menu, this memory is used to store any optional (loadable) emulations.

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Increasing this client's memory allows more complicated non-PostScript jobs to print and allows larger, optional emulations or multiple emulations to be loaded and ready to process jobs, without having to be reloaded every time a job in that emulation is sent.

If an emulation is loaded to process a print job and there is not enough memory in the emulation client, another emulation already loaded might be unloaded automatically to obtain the necessary memory. If you notice a delay in printing between jobs that have different non-resident emulations, it's possible that emulations are being reloaded each time they are run. Adding to the emulation client might eliminate this unloading and reloading and, consequently, increase throughput.

Also, increase the emulation client if you are printing complex non-PostScript jobs that might require more memory to process correctly.

Temporary Emulation

Listed as K Mem Emul Tmp in the Administration/Memory menu and as Emulation Temporary elsewhere, this memory is used by non-PostScript emulations for storing downloaded fonts, forms, and macros. This allows "context switching," which is the ability to retain downloaded fonts and forms even after the printer changes from one emulation to another. Context switching prevents repetitive downloading and traffic congestion on networks.

Normally, this memory client does not need to be changed unless you plan to download many different non-PostScript fonts.

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Display List

Listed as K Mem Display in the Administration/Memory menu, this client shares its memory with the PostScript heap. The display list stores compressed representations, or blocks, of the pages to be printed. Approximately 1 compressed block is required for a normal 8.5" x 11" text page, 4 compressed blocks for an 8.5" x 11" page that includes some graphics, and as many as 500 compressed blocks for an extremely complex page. Approximately 64 KB of memory for each compressed block is required by the printer.

Many pages of compressed blocks belonging to multiple print jobs can be stored simultaneously in the display list. If enough memory is allocated to this memory client, a page can always be ready to print as soon as another page has been imaged by the print engine, so increasing the amount of memory in this client might improve printing throughput. If not enough memory is allocated to this client, memory is taken from the excess memory client (PostScript heap) to complete the print job.

Disk Cache

Listed as K Mem Disk Cache in the Administration/Memory menu, this memory client stores frequently used data in system memory instead of continually storing and retrieving it from a hard disk. If a hard disk is used and a lot of disk access is required, adding memory to the disk cache might increase the printer's performance. For example, if many fonts are stored on disk, increasing the disk cache size can help the printer access these fonts faster.

The amount of memory needed for the disk cache client depends on the size of the disk, the number of disks, the number of subdirectories on each disk, and the amount of memory dedicated to caching. The disk cache size should be set to 0 KB if no hard disks are connected to the printer, or if the hard disks are connected

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but are not being used. However, the hard disks remain unavailable until this client's size is increased.

The recommended amount of memory for the disk cache client is as follows:

- 120 KB minimum
- 0.5 KB per MB of disk storage total for all disks

MB Printer Mem

This memory client shows the number of megabytes of RAM available to be split among the memory clients when disk swapping is turned off.

System Memory

Listed as System Use on the status page, this non-configurable client is the amount of RAM that is used to run the printer's operating system. It is never increased or decreased. The system memory subtracted from the total amount of RAM identifies the amount of RAM available for all the other memory clients.

Hard Disk Management

In addition to your printer's internal hard disk, you can connect up to six external hard disks to your printer via the SCSI port. These hard disks serve as secondary storage places for such items as downloaded fonts, emulations, and spooled data. Once you have a hard disk installed on your printer, it has virtual memory capabilities for spooling overflow, which is an extension of the spool memory client.

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Spooling Overflow

The spool overflow option (Administration/Disk Operations menu) specifies the maximum space reserved for spooling overflow on the hard disk, if one is available.

When a print job is sent to your printer, a portion of that job is stored in the spooling buffer (Administration/Memory/K Mem for Spool menu) while the rest of the job is being printed. If all the memory in the spooling buffer is being used and the spool overflow option is enabled, the printer stores the overflow from the spooling buffer in a reserved area of the hard disk. Even if you have a hard disk, you should allocate as much RAM to the spool buffer as possible for increased throughput.

Reserving a 10-20 MB portion of the hard disk for spooling overflow works well for most printing environments. If too much of the disk is dedicated to spooling, the printer's performance might actually be hindered because the printer tries to fill the overflow space before passing the job to the processor.

PS Protocol

Your printer supports a new protocol for communication between the printer and a host computer over a serial, parallel, or optional interface connection. This new protocol is called PS protocol. This binary communications protocol allows any 8-bit binary value (0-255) to be treated as data, while allowing a few of the values to function as special control characters. When communicating 8-bit binary data in binary or binary fixed mode, the printer uses the quoting mechanism of the binary communications protocol (BCP) to distinguish between the special control characters and print job binary data.

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To differentiate data from the special control characters, any data that is the same as one of the following special control characters must be quoted.

ASCII Keyboard	ASCII Name	ASCII Hex	Control Function
^A	SOH	0x01	Quote data character
^C	ETX	0x03	Abort job and flush to end of file
^D	EOT	0x04	End-of-file marker
^E	ENQ	0x05	(Reserved for future use)
^Q	DC1	0x11	XON in XON/XOFF flow control
^S	DC3	0x13	XOFF in XON/XOFF flow control
^T	DC4	0x14	Job status request
^\	FS	0x1C	(Reserved for future use)

A data byte is quoted by replacing it with a two-character sequence. The first character is a ^A (ASCII hex 0x01), and the second character is the character itself XORed with the ASCII value 0x40. For example, to send the value 0x14(^T) as data, send the two-character sequence 0x01 0x54 (^a T) instead. (ASCII "T" is the result of XORing ^T with 0x40).

This method of quoting guarantees that whenever the printer receives any of the eight control characters, the control function is intended regardless of whether the preceding character is a ^A. Any data byte not equal to one of the eight special control characters is transmitted by sending the data byte. For more information on BCP and quoting, see the *PostScript Language Reference Manual* (Adobe Systems, Inc., Reading, MA: Addison-Wesley, 1990, ISBN 0-201-18127-4), the "Adobe Serial and Parallel Communications Protocols Specification" (in *Adobe Developer Support.* Adobe Systems, Inc., February 14, 1992), and the "PostScript Language Reference Manual" (in *Supplement for Version 2011*, Adobe Systems, Inc., January 24, 1992).

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PS Protocol Menu for Optional Network Interfaces

These options for the PS Protocol menus for optional network interface cards set the binary communications protocol (BCP) for communicating over that interface to a PostScript printer. The default option is normal. Any change to this menu takes effect immediately.

PS Protocol Menu

Normal
Normal Fixed
QBinary
QBinary Fixed
Binary
Binary Fixed

Normal — Enables standard, ASCII hex protocol. Data is sent and received in ASCII format. This mode is recommended if you do not print binary data. It was designed for data in the printable ASCII range. Print jobs can alter the PS protocol value through PostScript operators.

Normal Fixed — Enables standard, ASCII hex protocol. Print jobs can not alter this value through PostScript operators.

QBinary — Quoted Binary. Enables binary communications protocol. Print jobs can alter this value through PostScript operators. Data in the printable ASCII range also prints. Use the special quoting mechanism for the special characters and ^D (EOF).

QBinary Fixed — Quoted Binary Fixed. Enables binary communications protocol. Print jobs can not alter this value through PostScript operators. Data in the printable ASCII range also prints. Use the special quoting mechanism for the special characters and ^D (EOF).

Binary — Enables binary communications protocol. Print jobs can alter this value through PostScript operators. Data in the printable ASCII range also prints.

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Binary Fixed Enables binary communications protocol. Print jobs can not alter this value through PostScript operators. Data in the printable ASCII range also prints.

A data stream sent through the serial or parallel interface using Binary would be treated the same as a data stream sent through the optional network interface using Quoted Binary on your QMS Crown printer. However, a data stream sent through the optional network interface using Quoted Binary would not be treated the same as a data stream sent through the same interface using Binary.

Advantages

The main advantage of using the Binary and Fixed Binary PS protocol modes when sending binary data is that these modes compress the data stream allowing your documents to be smaller so you can send smaller jobs to the printer. For example, some device drivers can format bit map images as binary data instead of as ASCII hex data.

Implementation

To implement PS protocol for sending binary data on your system you need a device driver available with some applications or operating systems, or you can alternatively use a program to read the data and write out the quoted characters. See your QMS vendor for any available information on device drivers or binary filter programs.

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Updated DOCs

This section provides updated information on HP PCL 4 and PCL 5 DOCs. This information will be merged into the appropriate manuals as they are revised. But until then, it supersedes the following: *QMS Crown Document Option Commands manual* (part number 1800216-001E) and *HP PCL 5 Emulation Technical Reference Manual* (part number 1800304-001A).

PCL 5 Emulation Terminology

Font

A font is a unique set of objects that has an ID and attributes (symbol set, spacing, pitch, height, style, weight, and typeface number). A font is accessed by specifying a desired set of attributes. The system selects the font that most closely matches these attributes from the available set of fonts. See the *PCL 5 Emulation Technical Reference Manual* for information on what characterizes a PCL font.

There are two types of fonts: bound and unbound. A bound font supports a single symbol set. An unbound font supports multiple, but not all, symbol sets. With unbound fonts, the symbol sets are organized into two groups: normal and Dingbats. All downloaded fonts are bound, and all resident fonts (except Zapf-Dingbats which supports the Dingbats symbol set) support the group of normal symbol sets.

In the QMS PCL 5 emulation, only fonts located in the current resource may be accessed by a PCL font ID using the normal <ESC>(#X sequence. All other fonts (resident, cartridge, or other),

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including those stored on the additional resources, can be accessed only by attributes.

Also, only objects stored in the current resource may be deleted directly by the PCL language. Therefore, unless they are explicitly removed, external fonts are always available to all PCL jobs.

Font Index Number

In addition to its ID, a downloaded font also has an unique index number that is automatically assigned by the printer when the font is downloaded. This index number may change if new resources are added, but in practice it usually remains fixed. All currently available PCL fonts (resident, cartridge, temporary, permanent, and external) are listed with their font index numbers on the Advanced Status Page.

The font index number defines the default PCL font to be used if "selectbyid" is specified as the default PCL font. Do not confuse the font index with the PCL font ID, a mechanism used to identify downloaded fonts in the PCL language using the <ESC>(#X sequence. There is no way to specify fonts by their font index numbers from within the PCL language. Only the default PCL font is affected.

Object

There are three types of PCL downloaded objects: temporary, permanent, and external. Temporary objects reside on the current resource and they are deleted either at the beginning and end of a job (unless Retain Temporary is set to On or On Compatibility) or when the system is reset (<ESC>E or receipt of Printer Job Language). Permanent objects reside on the current resource and

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are retained when the system is reset (E or receipt of Printer Job Language). External objects reside on the additional resources.

All objects are temporary when first created. They can be made permanent objects through PCL commands. Both temporary or permanent objects can become external objects when the current resource is changed (for temporary objects Retain Temporary must be set to On, True, or On Compatibility). External objects become permanent when the resource in which they reside becomes the current resource.

User-downloaded PCL objects (with the exception of palettes) are identified by an ID when they are downloaded. The ID is usually set by the file performing the download. If not, the system will provide a default value (normally 0, but this can be set using the %%IncludeFeature:install DOC). If two objects of the same type are provided with the same ID, the last one received replaces the former. From that point on, downloaded objects are accessible by their IDs.

Resource

A resource is a location where downloaded objects such as fonts, macros, and patterns are stored. The printer has one default resource and one additional resource for each attached hard disk. All downloaded objects are stored in file systems which reside on these resources. The RAM1 resource may be used as the default, but systems with at least one hard disk use the system disk instead. So, for any hard disk-equipped printer, all downloaded objects (except palettes, which require special handling) are stored on disk. The default resource and one of the additional resources can reside on the same hard disk, but they will be located in different directories of that resource's file system.

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Updated PCL 5 DOCs

%%IncludeFeature:scalablefonts(*value***)**

Purpose: Enables/disables PCL 5 scalable fonts (to print PCL 4 documents that have selected PCL 5 scalable fonts or to more closely emulate the PCL 4 font environment).

value: 0 (enables scalable fonts) or 1 (disables scalable fonts)

Default: 0

%%IncludeFeature:install(*resource id object id***)**

Purpose: Establishes the current resource and the default object ID value for the current job to which it is attached. If it is attached to a job that downloads a font without setting the current object ID using the PCL escape sequence <ESC>(#X, it has the appearance of "storing" the font on disk. If no %%IncludeFeature:install DOC command is sent, the internal default location is used; otherwise, this parameter, which must be provided, specifies one of the alternate locations. For most QMS printers, resource 6 is the internal system disk.

resource id: 0 to 6 (identifies one of the possible locations for downloaded objects). Default: internal system disk

object id: 0-32767 (assigns an ID to an object, such as a font, macro, or pattern). Default: 0. The object ID can be used instead of the usual PCL command to assign an ID. This ID is overwritten by any ID assigned from the PCL print job, if present. If neither a DOC command nor the PCL print job specify an ID, the default ID of 0 is used. Identifiers must be unique. If the ID matches an ID for an existing object, that object is deleted and replaced by the new object. If a %%IncludeFeature:remove command precedes a %%IncludeFeature:install command, the install command is ignored (these two commands are mutually exclusive). All downloaded objects are by default temporary and will be deleted at the end of a

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job unless Retain Temporary is set to On or On Compatibility. If the file the %%IncludeFeature:install command is attached to does not make its downloaded fonts permanent or Retain Temporary is not set, then those objects are removed from the disk when the job completes. A downloaded font can be accessed only by its ID if the font is stored in the current resource. Regardless of its resource, a font can be selected by its attributes. Example A shows a pair of jobs that will not produce the desired results (subjob 2 has only the appearance of storing the font on disk). By contrast, examples B and C show a pair of jobs that will produce the desired results.

Example A: Job 1

```
%!
%%IncludeFeature:emulation(pcl5) install(6
20)
%%EndComments
<ESC>)s#W<download font header>*c33E
(s#W<char 33 data>*c34E
(s#W<char 34 data>... *c5F
```

Example A: Job 2

```
<ESC>(20Xthis text is NOT in the downloaded
font...
```

Example B: Job 1

```
%!
%%IncludeFeature:emulation(pcl5) install(6
20)
%%EndComments
<ESC>)s#W<download font header>*c33E
```


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```
(s#W<char 33 data>*c34E
(s#W<char 34 data>. *c5F
```

Example B: Job 2

```
<ESC>(8U(s1p12v0s0b4153This text will be in
the downloaded font, if it supports the
ROMAN-8 symbol set, is proportionally
spaced, 12 points in height (or scalable),
upright, medium weight, and has type # 4153.
```

Example C: Job 1

```
%!
%%IncludeFeature:emulation(pcl5) install(6
20 )
%%EndComments
<ESC>)s#W<download font header>*c33E
(s#W<char 33 data>*c34E
(s#W<char 34 data>... *c5F
```

Example C: Job 2

```
%!
%%IncludeFeature:emulation(pcl5) install(6)
%%EndComments
<ESC>(20Xthis text is also in the downloaded
font...)
```

%%IncludeFeature:remove(*resource id object id object type***)**

Purpose: Removes an external object from the printer system.

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object type: *, font, macro, pattern, or other object type (specifies the kind of objects that are to be deleted from the specified printer system). If object type is * or is not specified, then all objects on the specified resource with the specified object id are removed.

object id: *, -1 (wildcard) to 32767 (specifies the ID of the object that is to be removed from the printer system). Default -1. If the object id is not specified, or if it is specified as * or -1, all objects on the specified resource are removed. Unlike the %%IncludeFeature:install command, the %%IncludeFeature:remove command does not set any defaults, and it is not directly related to the job to which it is attached. This command allows you to remove external objects from the system without having to generate a job containing both the DOC command to set the appropriate current resource and the PCL code to delete the desired object. If this command is specified more than once, the last command received is the one that will be executed. In the following example, the remove(6 5 font) command is executed, and the remove(6 1 macro) command is ignored:

```
%%IncludeFeature:remove(6 1 macro) remove(6
5 font)
```

%%IncludeFeature:resource(*resource id object code***)**

Purpose: Establishes the current resource and the default object code value for the current job to which it is attached. This command is identical to the %%IncludeFeature:install DOC. It is included for backward compatibility. All downloaded objects are by default temporary, and will be deleted at the end of a job unless Retain Temporary is set to on, true, or on compatibility. If the file that the %%IncludeFeature: resource command is attached to does not make the downloaded font permanent and Retain Temporary is not set, then those objects are removed from the disk when the job completes. A downloaded font can only be accessed by its ID if the font is stored in the current

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resource. Regardless of its resource, a font can be selected by its attributes.

resource id: 0 to 6 (identifies one of the possible locations for downloaded objects). Default: internal system disk. If no resource item is provided, the internal default location is used; otherwise, this parameter, which must be provided, specifies one of the alternate locations. For most QMS printers, resource 6 is the internal system disk.

object code: 0-32767 (assigns a code to an object such as a font, macro, or pattern).

%%IncludeFeature:font (*font name*)

Purpose: Specifies the default font to use. Fonts are identified by the names shown above. Only the resident fonts may be selected (the available set varies from printer to printer). An asterisk * in the name indicates that a font is scalable, and that a point size needs to be applied using the pointsize command. The value selectbyid indicates that the default font ID or unique font index (set by the fontid command) will be used for default font selection. Selecting a bound, bitmap font overrides the default settings for symbol set and point size. An unbound font uses the specified default symbol set if possible, while a scalable font uses the default font size.

font name:
courier12times*blditalic
courier12bolduniv*
courier12italicuniv*italic
courier10univ*bold
courier10bolduniv*blditalic
courier10italicunivcond*
lineprinter
univcond*italic
times*univcond*bold
times*italicunivcond*blditlc
times*bold
selectbyindex

%%IncludeFeature:fontid (*index #*)

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Purpose: Specifies the default font index number. This index is used when the Default Font selected is selectbyid. This allows for selection of fonts only on the current resource. Selection of default font by index overrides the symbol set value. The symbol set is overridden if a bound font is selected as the default or if an unbound font is selected that does not support the default symbol set. If a font with the specified index exists, it is selected as the Default Font. If the specified value does not exist, courier 12 point is substituted.

index #: 0 to 32767

%%IncludeFeature:symbolset (*name*)

Purpose: Specifies the default symbol set for the emulation. This command specifies the default symbol set. Not all symbol sets are available with certain resident fonts. In particular, the Desktop, PS Math, Math 8, Microsoft Pub, Pi Font, PS Text, Ventura Intl, Ventura Math, Ventura US, and Windows symbol sets cannot be used with the resident bitmap fonts: courier10, courier10bold, courier10italic, courier12, courier12bold, courier12italic, and lineprinter. The five dingbat symbol sets (PS-Zapf-Dingbats, Ventura-Dingbats, Zapf-Dingbats100, Zapf-Dingbats200, and Zapf-Dingbats300) can be used with all fonts. If a mismatch between symbol set and font occurs, the standard PCL font selection mechanism is used to locate a font that matches the selected symbol set. With the standard set of fonts distributed by QMS, this matches the Times* font, but other user installed fonts could change this result.

name: roman-8iso-60, pc-850iso-61, pc8-usiso-69, pc8-dniso-84, ecma-94iso-85, legaldesktop, hpgerman ps-math, hpspanishmath8, iso-2microsoft-pub, iso-4pi-font, iso-6ps-text, iso-10ventura-intl, iso-11ventura-math, iso-14ventura-us, iso-15windows, iso-16ps-zapf-dingbats, iso-17ventura-dingbats, iso-21zapf-dingbats100, iso-25zapf-dingbats200, iso-57zapf-dingbats300

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%%IncludeFeature:criscrlf(*value*)

Purpose: Controls the default line termination mode (the <ESC>&k#G command). Specifies the line termination treatment of a carriage return.

value: off (treat line feed as a line feed) or on (treat line feed as a carriage return-line feed combination).

The result of various settings for these parameters is shown in table below, in terms of the equivalent code passed to the PCL line termination command (<ESC>&k#G). The second setting (lfiscrlf on, criscrlf off) is correct for most ASCII listings printed from UNIX machines. PC listings should usually be done with both items set to off, and Macintosh listings usually require the third setting (lfiscrlf off, criscrlf on). The following table shows the criscrlf/lfiscrlf commands and the corresponding PCL Line Termination command parameters.

LFISCRLF	CRISCRLF	PCL Code	Comments
Off	Off	0	CR is CR, LF is LF, FF is FF
On	Off	2	CR is CR, LF is CR-LF, FF is CR-FF
Off	On	1	CR is CR-LF, LF is LF, FF is FF
On	On	3	CR is CR-LF, LF is CR-LF, FF is CR-FF

%%IncludeFeature:lfiscrlf (*value*)

Purpose: Controls the default line termination mode (the <ESC>&k#G command); specifies the line termination treatment of a linefeed.

value: off (treats linefeed as a linefeed) or on (treats linefeed as carriage return-linefeed combination).
The result of various settings for these parameters is shown in the table included in the Set Carriage Return (Line Termination) discussion, in terms of the

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equivalent code passed to the PCL line termination command. The second setting (lfiscrlf on, criscrlf off) is correct for most ASCII listings printed from UNIX machines. PC listings should usually be done with both items set to Off, and Macintosh listings usually require the third setting (lfiscrlf Off, criscrlf On). Note that the FF becomes a CR-FF when the LF is a CRLF.

%%IncludeFeature:linesperinch (*#*)

Purpose: Sets the default PCL line spacing. The %%IncludeFeature:linesperinch DOC affects PCL's default VMI (vertical motion index).

#: 1-48. Default: 6.

%%IncludeFeature:pointsize(*default font size*)

Purpose: Specifies the point size for scalable default font. If the selected font is not scalable or if a bitmap font size is specified, this setting is ignored.

default font: 0.25 to 999.75 in 0.25 increments.

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Glossary

For more information about a term, check the index listings.

Application A computer program designed to help people perform a certain type of work, for example, a word processing program, a page layout program, a programming language, or software that handles graphics and prints documents, spreadsheets, and/or forms.

Consumables Supplies that are used up, like print media, toner, and developer.

Crown A proprietary multitasking printer operating system, which allows QMS to adapt an advanced software code base to the evolving printing needs of users in many different operating environments. As implemented in the QMS Crown family of products, this modular, portable architecture provides advanced features as well as the capability to easily integrate new features as they become available. A QMS Crown printer can process and print jobs simultaneously instead of sequentially (multi-task) because of advanced memory management techniques such as simultaneous interfacing, input buffering, job spooling, emulation sensing processing, compile-ahead technology, and compressed data formats.

Default The values or settings built-in to a system or program. The default settings in this printer can be changed. See also *factory default*.

Emulation The ability of the printer to respond to commands that are intended for a different type of printer. For example, when the printer is set for PostScript Level 2 emulation, it responds to the same commands that a PostScript Level 2 printer does.

Engine The non-intelligent part of a printer where the paper is physically processed and printed.

ESP Technology **E**mulation **S**ensing **P**rocessor Technology: technology that uses a form of artificial intelligence to analyze incoming file data from any of the printer's interfaces. ESP technology, which works with most popular commercially available applications, selects the appropriate printer

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emulation from those installed on the printer and processes the print job, freeing the user from having to change printer switch settings or send software commands to accommodate different printer emulations. ESP mode is an option for the printer's LocalTalk, serial, and parallel interfaces.

Factory Default The printer settings that are programmed into the printer at the factory. These settings can be changed through the printer control panel or overridden with printer commands sent through software. See also *default*.

Imageable Region The areas of a page size a printer can access, determined by hardware limits (physical page size and margins required by the printer engine) and software constraints (amount of memory available for the full-page frame buffer). Also referred to as imageable area and printable region.

Interface The place where a physical connection is made between components, such as a cable and printer, and communication or signals are passed back and forth.

Laser Paper Paper designed for laser printing. Laser paper allows the richest color and black and white output and the most consistent coverage (especially for large areas of one color). It is best for prepress proofs. For laser paper printing, we recommend Hammermill Laser Print. Laser paper has a printable side and a non-printable side; usually, the printable side is indicated by an arrow on the side of the wrapping covering the media, and that side is slightly smoother. See also *plain paper*.

Manual Feed Feeding single sheets of print media to the printer by hand (as opposed to letting the printer automatically pull sheets from a cassette).

Media See *print media*.

Mode One of several alternative conditions or methods of operation.

Network Administrator See *system administrator*.

Option In this manual, either a choice available in the printer's Configuration submenu, or an extra accessory you can purchase for your printer.

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PDL **P**age **D**escription **L**anguage: a programming language, such as PostScript or HP-GL, that translates messages from a computer to a printer. See also *PostScript*.

Planes Toner, developer and OPC belt measurements (rather than copies) for usage. A plane is a pass of the OPC belt for one color, so a one-color page makes one pass (one plane), a two-color page makes two passes (two planes), and so forth.

Plain Paper Uncoated, general-purpose paper designed for photocopy printing, found in most offices. It is less expensive than laser paper, but does not offer the same output quality that laser paper does. This printer has plain paper capability: it produces good output on documents such as reports and newsletters. See also *laser paper*.

PostScript A page description language trademarked by Adobe Systems Inc. PostScript Level 2 capabilities, among others, are implemented in the printer through a PostScript emulation developed by QMS. PostScript Level 2 emulation is the native language of your printer's controller. It describes text, graphics, and page images to the printer.

Print Media The material on which the printer prints (for example, paper, transparencies, and labels).

Printer Driver A file that enables the application to talk to the printer, translating computer data into a form understood by the printer. Usually, the printer driver is in the application.

Protocol A set of procedures that control how data is transmitted between devices.

QCOLOR A QMS-developed technology for automatically optimizing color printing from Windows and Macintosh applications. QCOLOR configures the *magicolor LX* for the best output quality based on the contents of the document (for example, text, line art, presentation graphics, photographs, or scans).

Resident Permanent printer features.

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SIO **S**imultaneous **I**nterface **O**peration: a Crown function that allows printing to all three of the printer's concurrently active ports. See also *Crown*.

Software Loadable System (SLS) Your printer offers a software loadable system, SLS, which allows you to add features and enhancements as they become available from QMS. This feature works through the parallel port via the control panel or PS Executive Series Utilities, and it makes it easier for you to keep up with the latest software changes.

Start-Up Page A page generated automatically when you turn on the printer, if it has not been disabled through the control panel, an application (such as PS Executive Series Utilities), a PostScript operator, or a DOC function. This page gives limited information on the printer, such as the printer's name, the number of pages printed to date, current interface settings, and the amount of RAM available.

Status Page A page or multiple pages listing detailed printer status, such as identification information and settings, current memory configuration, timeout values, communication and buffer settings, and available fonts. The printer has two status page options, standard and the advanced. The standard page is more detailed than a start-up page, but far less so than the advanced option. (See "The Status Pages" in chapter 5 for details.)

System Administrator The person in charge of operating a network; also called a network administrator.

Trailer Page A separator page that prints after the last page of a print job to identify a print job and help users sort out jobs. For details on this page and what it monitors, see "Header and Trailer Pages" in chapter 5. Also, the information on trailer pages for this printer can be customized with QMS Document Option Commands. (The *QMS Crown Document Option Commands* manual, which came with your printer, contains more information.)

Utility Software, such as PS Executive Series Utilities, that performs a specific function of system management, such as maintaining disks and files or controlling a printer.

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